

**SITE INVESTIGATION
REPORT FOR IRP SITES
NO. 25 AND NO. 26**

VOLUME II

**148th FIGHTER WING
MINNESOTA AIR NATIONAL GUARD
DULUTH AIR NATIONAL GUARD BASE
DULUTH, MINNESOTA**

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JUNE 1996



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Prepared For
**HQ ANG/CEVR
ANDREWS AFB, MARYLAND**

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Prepared By
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Site Investigation Report for IRP Sites No. 25 and No. 26, 148th Fighter Wing, Duluth Air National Guard Base, Duluth, MN; Volume II, Appendix A through L. This is the second volume of a four volume site investigation report. This investigation involves two sites; site 25 -- Old Motor Pool area; and site 26 -- Ramp Disposal Area. Soil and groundwater contamination above state action levels were found at site 25; no significant contamination was found at site 26. Site 25 cleanup will be included in the scheduled cleanup of site 21.

14. SUBJECT TERMS

Installation Restoration Program; Comprehensive Environmental Response,
Compensation and Liability Act (CERCLA); Air National Guard; Site Investigation;
Minnesota Air National Guard; Duluth, MN.

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APPENDIX A
BORING LOGS

INTRODUCTION

Boring log diagrams have been compiled for each borehole location drilled during this study. Diagrams are presented in numerical order within each site. The borehole identification is keyed to the site number (017-01BH), borehole (BH), or monitor well designation (MW). The diagrams combine in one page both a verbal and graphical illustration of the lithology encountered during drilling, water level data encountered during drilling, and surveyed elevation of the ground surface at the borehole location.

Drilling records are organized sequentially by number for boreholes and the monitor well. The borehole identification is keyed to the site number and borehole type such as soil boring for acoustic topography survey (BH) or monitor well designation (MW).

The soil core was scanned for volatile organic compounds prior to describing the soil core and results were recorded on the boring logs. As soon as the soil core was removed from the sampling assembly, a portable Thermo Instrument Model 580B photoionization detector was used to monitor for volatile organic compounds and a portable HMX251 explosimeter was used to monitor the lower explosive limit and percent oxygen.

The sample description includes the primary major component or components, color, consistency, relative density, texture, moisture, and observations of each distinct lithologic change encountered. Each distinct lithologic change that was encountered was defined by the Unified Soil Classification System (USCS), which is based on texture, sorting of clasts, and plasticity of soils. The color was determined by visually comparing the color of the sample with the Munsell Soil Color Charts. The texture was visually estimated and described using the following semi-quantitative adjectives:

<u>Adjective</u>	<u>Estimated Percent of Total Sample</u>
Trace	0 - 5
Little	5 - 12
Some	12 - 35
Add	35 - 50

These adjectives precede the lithology, such as little clay (5 - 12% clay) or some sand (12 - 35% sand).

The classification: Sand, granule, cobble, and boulder, was assigned using the grain-size scale given in the USCS. Gravel clast sizes, boulder, cobble, and pebbles were measured using a steel tape in the field. On the original field lithologic logs, clasts that were 4 inches or greater in size and those that were from 2 to 4 inches in size were reported as boulders and cobbles, respectively.

The fine fraction was described using one of the following terms: Silt, silt and clay, or clay. These are field terms and take into account plasticity as well as grain size. The distinction between clay and silt was based on how easily a small piece of soil could be rolled into a thin ribbon. Clay can easily be smeared into a ribbon when wet while silt is smeared with more difficulty. A dry sample of clay is difficult to crush with fingers while a dry sample of silt is more easily crushed.

LITHOLOGIC LOGS
















Lithologic symbols are derived and generalized from the USCS shown in Figure A.1.

In the boring logs that follow, the column headings have the following meaning:

Depth:	Depth in feet below surface.
Blows:	The number of blows required to drive a split-spoon sampler an additional 24 inches into the ground beyond the initial 6-inch set.
Ambient Temperature Headspace Analysis (ATHA):	The reading of photoionizable compounds detected in the contained soil sample by a photoionization detector.
Samples:	The interval of sample cored below land surface.
Percent Recovery:	The percentage of sample recovered in the split-spoon sampler per sampling run.
USCS:	Unified Soil Classification System based on texture, sorting of clasts and plasticity of soils.

KEY TO BORING LOG SYMBOLS

UNIFIED SOIL CLASSIFICATION SYSTEM - ASTM D2487

MAJOR DIVISIONS			SYMBOL/ GRAPHIC	DESCRIPTIONS
COARSE-GRAINED SOILS (>50% Smaller Than #200 Sieve)	GRAVELS (More than 50% of coarse fraction is larger than the #4 sieve size.)	Clean gravels with little or no fines	GW	 Well-Graded Gravels, Gravel - Sand Mixtures
			GP	 Poorly Graded Gravels, Gravels - Sand Mixtures
		Gravels with over 12% fines	GM	 Silty Gravels, Poorly Graded Gravel-Sand-Clay Mixtures
			GC	 Clayey Gravels, Poorly Graded Gravel-Sand-Clay Mixtures
	SANDS (More than 50% of coarse fraction is smaller than the #4 sieve size.)	Clean sands with little or no fines	SW	 Well-Graded Sands, Gravelly Sands
			SP	 Poorly Graded Sands, Gravelly Sands
		Sands with over 12% fines	SM	 Silty Sands, Poorly Graded Sand-Silt Mixtures
			SC	 Clayey Sands, Poorly Graded Sand-Clay Mixtures
FINE-GRAINED SOILS (>50% Smaller Than #200 Sieve)	SILTS AND CLAYS (Liquid limit less than 50)		ML	 Inorganic Silts and Very Fine Sands, Silty or Clayey Fine Sands
			CL	 Inorganic Clays of Low to Medium Plasticity: Gravelly, Sandy or Silty Clays; Lean Clays
			OL	 Organic Clays and Organic Silty Clays of Low Plasticity
	SILTS AND CLAYS (Liquid limit greater than 50)		MH	 Inorganic Silts, Micaceous or Diatomaceous Fine Sandy or Silty Soils, Elastic Silts
			CH	 Inorganic Clays of High Plasticity Fat Clays
			OH	 Organic Clays of Medium to High Plasticity, Organic Silts
	HIGHLY ORGANIC SOILS		Pt	 Peat and Other Highly Organic Soils



Sample retained for on-site screening.



Sample prepared for laboratory analysis.



Water Table Level.

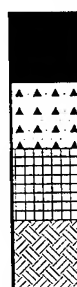
PID Photo-Ionization Detector readings (ppm).

ND Parameter Not Detected

NA Measurement Not Applicable, Groundwater Not Detected

- No Measurement Performed

NR No Sample Recovery



Asphaltic Concrete

Portland Cement Concrete

Cement Grout

Boulders or Bedrock

DRAFT
FIGURE A.1

FORMS\KEYLOG2

KEY TO BORING LOG SYMBOLS
Duluth Air National Guard Base
Duluth, Minnesota

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CORPORATION

AUGUST 1995

PID:

A Photoionization Detector used to monitor volatile organic compounds in uncontained soil and/or groundwater samples.

REFERENCES

Casagrande, A., 1948. Classification and identification of soils. Transactions of the American Society of Civil Engineers 113:901.

Folk, R. L., 1980. Petrology of Sedimentary Rocks. Hemphill Publishing Company. Austin, TX. p. 182.

DULUTH SI
DULUTH, MINNESOTA, SITE 25

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LOG OF BORING 025-02BH

Project No.:	1315-197	Sampling Method:	Split Spoon Sampler
Logged By:	Kathleen Merino	Depth Drilled:	15 ft.
Drilling Co.:	American Engineering Testing	Depth To Water:	11 ft
Driller:	J. Tuura	Date Measured:	05/15/95
Date Drilled:	05/15/95	Surface Elevation:	1421.24 ft.
Drilling Method:	Hollow-Stem Auger		

Depth (ft.)	Blows/6"	% Recovery	Samples	Graphic	DESCRIPTION OF MATERIALS	FIELD SCREENING			
						PID	ATHA	-	-
4	4	40			Asphalt	0	58		
17	17				Silt, little sand (fine), trace gravel (pebble-cobble) dry.				
9	9				Dark Brown (7.5 YR 4/4).				
7	7					541	1391		
					Same as above.				
5	11	60				330	1339		
	10								
	16								
	15								
10	10	60			Strong hydrocarbon odor, silt, some sand (coarse)				
	6				Moist to wet (10 YR 2/2) Very dark brown.				
	12								
	47								
15					Boring terminated at 15 ft. BLS				
					Note: Drilling terminated at 15 feet BLS due to high				
					LEL (12.0) & PID (421 ppm) reading.				
20									

DULUTH SI

DULUTH, MINNESOTA, SITE 25


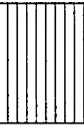



O P T E C H

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LOG OF BORING 025-03BH

Project No.: 1315-197
 Logged By: Kathleen Merino
 Drilling Co.: American Engineering Testing
 Driller: J. Tuura
 Date Drilled: 05/15/95
 Drilling Method: Hollow-Stem Auger

Sampling Method: Split Spoon Sampler
 Depth Drilled: 25 ft.
 Depth To Water: 23 ft. BLS
 Date Measured: 05/15/95
 Surface Elevation: 1420.48 ft.

Depth (ft.)	Blows/6"	% Recovery	Samples	Graphic	DESCRIPTION OF MATERIALS	FIELD SCREENING			
						PID	ATHA	-	-
					Asphalt				
	4	60	X		Silt, little sand (fine, trace clay. Dry. Soft. Dark brown. (7.5 YR 4/4)	0	0		
	5								
	7								
	5								
5	8	75	X		Silt, trace sand (fine), trace gravel. Firm. Slightly moist. Dark brown (7.5 YR 3/4).	0	467		
	8								
	11								
	11								
10	8	75	X		Strong hydrocarbon odor. Silt, trace sand (fine to coarse), trace gravel. Slightly moist. Dark brown (7.5 YR 4/4).	273	727		
	16								
	14								
	9								
15	9	80	X		Silt, trace sand (fine), slightly moist. Dark brown (7.5 YR 4/4).	133	53		
	11								
	13								
	16								
20	10	80	X		Same as above.	9.5	10.6		
	8								

DULUTH, MINNESOTA, SITE 25

**OPERATIONAL TECHNOLOGIES
CORPORATION**

Project No.:	1315-197	Sampling Method:	Split Spoon Sampler
Logged By:	Kathleen Merino	Depth Drilled:	25 ft.
Drilling Co.:	American Engineering Testing	Depth To Water:	23 ft. BLS
Driller:	J. Tuura	Date Measured:	05/15/95
Date Drilled:	05/15/95	Surface Elevation:	1420.48 ft.
Drilling Method:	Hollow-Stem Auger		

[illegible]

DULUTH SI

DULUTH, MINNESOTA, SITE 25

O P T E C H

OPERATIONAL TECHNOLOGIES
CORPORATION

LOG OF BORING 025-04BH

Project No.:	1315-197	Sampling Method:	Split Spoon Sampler
Logged By:	Kathleen Merino	Depth Drilled:	20 ft.
Drilling Co.:	American Engineering Testing	Depth To Water:	NA
Driller:	J. Tuura	Date Measured:	NA
Date Drilled:	05/16/95	Surface Elevation:	1423.53 ft.
Drilling Method:	Hollow-Stem Auger		


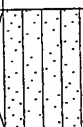

Depth (ft.)	Blows/6"	% Recovery	Samples	Graphic	DESCRIPTION OF MATERIALS	FIELD SCREENING			
						PID	ATHA	-	-
8		10			Asphalt				
8					Fill material, silt, trace sand, trace gravel. Dry.	0	0		
12									
12									
5		75			Silt, platy structure, fragile trace gravel (cobble). Dry.	0	0		
11					Dark brown (7.5 YR 3/4).				
16									
13									
13									
10		75			Silt and sand, dry, fragile. Dark brown (7.5 YR 3/4).	0	0		
10									
6									
9									
16									
15									
6		30			Silt, trace sand (fine). fragile. dry. Dark brown (7.5 YR 3/4).	0	0		
6									
3									
4									
20					Boring terminated at 20 ft. BLS				

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DULUTH, MINNESOTA, SITE 25

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OPERATIONAL TECHNOLOGIES
C O R P O R A T I O N

LOG OF BORING 025-05BH

Project No.:	1315-197	Sampling Method:	Split Spoon Sampler
Logged By:	Kathleen Merino	Depth Drilled:	22 ft.
Drilling Co.:	American Engineering Testing	Depth To Water:	14 ft. BLS
Driller:	J. Tuura	Date Measured:	05/16/95
Date Drilled:	05/16/95	Surface Elevation:	1423.87 ft.
Drilling Method:	Hollow-Stem Auger		

Depth (ft.)	Blows/6"	% Recovery	Samples	Graphic	DESCRIPTION OF MATERIALS	FIELD SCREENING			
						PID	ATHA	-	-
40	5 8 6 8	40	X		Silt, trace clay, dry. Dark brown (7.5 YR 4/4).	1.8*	0		
5	15 16 10 10	0	X		No recovery.	0	0		
10	10 13 16 10	80	X		Silt, some sand (medium). Soft dark brown (7.5 YR 4/4).	0	0		
15									
	12 10 8 8	0	X		No recovery.				
20	4 7	75	X		Silt, trace sand (medium), trace gravel (up to cobble) dark brown (7.5 YR 3/4). Very moist to wet.	0	0		

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DULUTH, MINNESOTA, SITE 25

O P T E C H

OPERATIONAL TECHNOLOGIES
CORPORATION

LOG OF BORING 025-06BH

Project No.:	1315-197	Sampling Method:	Split Spoon Sampler
Logged By:	Kathleen Merino	Depth Drilled:	22 ft.
Drilling Co.:	American Engineering Testing	Depth To Water:	NA
Driller:	J. Tuura	Date Measured:	05/12/95
Date Drilled:	05/12/95	Surface Elevation:	1421.05 ft.
Drilling Method:	Hollow-Stem Auger		

Depth (ft.)	Blows/6"	% Recovery	Samples	Graphic	DESCRIPTION OF MATERIALS	FIELD SCREENING			
						PID	ATHA	-	-
					Asphalt				
	5	80	X		Silt, little sand, fine to coarse grained sand, dry, fragile, dark brown (7.5 YR 4/4).	0	0		
	6								
	7								
	7								
5	10	80	X		Same as above: slightly moist.	0	0		
	10								
	11								
	12								
10	5	80	X		Silt trace sand, trace gravel: fine to coarse grained sand; granite cobble clasts, slightly moist; dark brown (7.5 YR 4/4).				
	9								
	13								
	17								
15									
	22	0	X		No recovery.				
	38								
	28		X						
	21								
20	9		X		Same as above, moist.	0.7	0		
	14								

DULUTH, MINNESOTA, SITE 25

**OPERATIONAL TECHNOLOGIES
CORPORATION**

Project No.:	1315-197	Sampling Method:	Split Spoon Sampler
Logged By:	Kathleen Merino	Depth Drilled:	22 ft.
Drilling Co.:	American Engineering Testing	Depth To Water:	NA
Driller:	J. Tuura	Date Measured:	05/15/95
Date Drilled:	05/12/95	Surface Elevation:	1421.05 ft.
Drilling Method:	Hollow-Stem Auger		

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DULUTH, MINNESOTA, SITE 25

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CORPORATION

LOG OF BORING 025-07BH

Project No.:	1315-197	Sampling Method:	Split Spoon Sampler
Logged By:	Kathleen Merino	Depth Drilled:	22 ft.
Drilling Co.:	American Engineering Testing	Depth To Water:	14 ft. BLS
Driller:	J. Tuura	Date Measured:	05/16/95
Date Drilled:	05/16/95	Surface Elevation:	1425.96 ft.
Drilling Method:	Hollow-Stem Auger		

Depth (ft.)	Blows/6"	% Recovery	Samples	Graphic	DESCRIPTION OF MATERIALS	FIELD SCREENING			
						PID	ATHA	-	-
1 2 3 5		35	X		Silt, trace sand (fine), trace gravel (up to cobble) slightly moist. Soft (7.5 YR 4/4).	0	0		
5 7 15 15 9		50	X		Silt, little sand (fine) slightly moist. Firm. Dark brown (7.5 YR 4/4).	0	0		
10 10 13 17		75			Same as above.	0	0		
15 5 3 4 6		20	X		Same as above.	0	0		
20 2 5		10	X		Silt, trace clay, trace gravel (up to cobble) trace sand (fine) Wet. Brown (7.5 YR 5/4).	0	0		

DULUTH, MINNESOTA, SITE 25

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LOG OF BORING 025-07BH

Project No.:	1315-197
Logged By:	Kathleen Merino
Drilling Co.:	American Engineering Testing
Driller:	J. Tuura
Date Drilled:	05/16/95
Drilling Method:	Hollow-Stem Auger

Sampling Method:	Split Spoon Sampler
Depth Drilled:	22 ft.
Depth To Water:	14 ft. BLS
Date Measured:	05/16/95
Surface Elevation:	1425.96 ft.

[illegible]

DULUTH, MINNESOTA, SITE 25

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Sampling Method:	Split Spoon Sampler
Depth Drilled:	15 ft.
Depth To Water:	NA
Date Measured:	NA
Surface Elevation:	1421.97 ft.

Depth (ft.)	Blows/6"	% Recovery	Samples	Graphic	DESCRIPTION OF MATERIALS	FIELD SCREENING			
						PID	ATHA	-	-
2 2 4 4		25	X	[Vertical Lines]	Silt, little sand (fine to coarse), trace gravel (up to cobble). Dry dark brown (7.5 YR 4/4).	0	0		
5 4 5 5 4		0	X		No recovery				
7 16 9 11		10	X	[Vertical Lines]	Silt, little sand (fine to coarse) trace gravel (up to cobble). Moist dark brown (7.5 YR 4/4).	2	12.4		
5 9 10 13 11		80	X	[Vertical Lines]	Silt, trace sand (fine), trace gravel (up to cobble) dark brown (7.5 YR 4/4).	.5	0		
4 3 5 9 15		60	X	[Vertical Lines]	Same as above.	0	0		
					Boring Terminated at 15 ft.				

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DULUTH, MINNESOTA, SITE 25

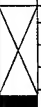


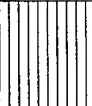




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LOG OF BORING 025-09BH

Project No.: 1315-197
 Logged By: Kathleen Merino
 Drilling Co.: American Engineering Testing
 Driller: J. Tuura
 Date Drilled: 05/12/95
 Drilling Method: Hollow-Stem Auger

Sampling Method: Split Spoon Sampler
 Depth Drilled: 15 ft.
 Depth To Water: NA
 Date Measured: 05/12/95
 Surface Elevation: 1417.29 ft.

Depth (ft.)	Blows/6"	% Recovery	Samples	Graphic	DESCRIPTION OF MATERIALS	FIELD SCREENING			
						PID	ATHA	-	-
2 3 7 8		30			Silt, organics, trace sand (fine) trace gravel. Dry. Dark brown (7.5 YR 4/4).	0	0		
5 2 4 4 4		30			Silt, trace sand (fine to medium) Very moist, Dark brown (7.5 YR 4/4).	0	0		
10 3 5 12 11		50			Same as above.	0	0		
3 5 7 6		60			Same as above.	0	0		
15 20					Boring Terminated at 15 ft.				

DULUTH, MINNESOTA, SITE 25

**OPERATIONAL TECHNOLOGIES
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Project No.:	1315-197	Sampling Method:	Split Spoon Sampler
Logged By:	Kathleen Merino	Depth Drilled:	7 ft.
Drilling Co.:	American Engineering Testing	Depth To Water:	6.5 ft. BLS
Driller:	J. Tuura	Date Measured:	05/12/95
Date Drilled:	05/12/95	Surface Elevation:	1397.29 ft.
Drilling Method:	Hollow-Stem Auger		


















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DULUTH, MINNESOTA, SITE 25

**OPERATIONAL TECHNOLOGIES
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Project No.:	1315-197
Logged By:	Kathleen Merino
Drilling Co.:	American Engineering Testing
Driller:	J. Tuura
Date Drilled:	05/17/95
Drilling Method:	Hollow-Stem Auger

Sampling Method:	Split Spoon Sampler
Depth Drilled:	20 ft.
Depth To Water:	NA
Date Measured:	NA
Surface Elevation:	1421.29 ft.

Drilling Method: Hollow Stem Auger						FIELD SCREENING			
Depth (ft.)	Blows/6"	% Recovery	Samples	Graphic	DESCRIPTION OF MATERIALS	PID	ATHA	-	-
7	7	90			Asphalt	0	2.8		
7	7				Silt, trace sand (medium), trace gravel (pebble). Fragile. Dry. Dark brown (7.5 YR 3/4).				
6	6								
6	6								
5	4	50			Silt, trace sand (fine). Firm. Slightly moist. Dark brown (7.5 YR 3/4).	9.6	6.9		
8	8								
9	9								
18	18								
10	8	75			Same as above.	7.5	6.5		
13	13								
17	17								
13	13								
15									
3	3	60			Silt, trace sand (fine), trace gravel (up to cobble). Firm. Slightly moist. Dark brown (7.5 YR 3/4).	4.5	3.2		
5	5								
4	4								
5	5								
20					Boring Terminated at 20 ft.				

O P T E C H
OPERATIONAL TECHNOLOGIES
CORPORATION

Project No.:	1315-197	Sampling Method:	Split Spoon Sampler
Logged By:	Kathleen Merino	Depth Drilled:	20 ft.
Drilling Co.:	American Engineering Testing	Depth To Water:	NA
Driller:	J. Tuura	Date Measured:	NA
Date Drilled:	05/17/95	Surface Elevation:	1421.97 ft.
Drilling Method:	Hollow-Stem Auger		

Drilling Method: Hollow-Stem Auger					FIELD SCREENING				
Depth (ft.)	Blows/6"	% Recovery	Samples	Graphic	DESCRIPTION OF MATERIALS	PID	ATHA	-	-
6 4 4 9		80			Asphalt	0	0		
					Silt, trace sand (fine), trace gravel (pebble) Fragile. Soft. Dry. Dark Brown (7.5 YR 4/4).				
5 12 10 18 24		20			Same as above.	0	0		
10 5 10 19 14		75			Silt, little gravel (up to brass sleeve 1.6"). Trace sand. Firm. Moist Dark brown (7.5 YR 3/4).	0	0		
15 6 13 16 18		75			Silt, little to some sand (medium) well sorted, moist. Soft. Dark brown (7.5 YR 3/4).	0	10.6		
20			Boring Terminated at 20 ft.						

DULUTH SI

O P T E C H

DULUTH, MINNESOTA, SITE 26

OPERATIONAL TECHNOLOGIES
CORPORATION

LOG OF BORING 026-01BH

Project No.:	1315-197	Sampling Method:	Split Spoon Sampler
Logged By:	Kathleen Merino	Depth Drilled:	10 ft.
Drilling Co.:	American Engineering Testing	Depth To Water:	6.8 ft.
Driller:	J. Tuura	Date Measured:	05/04/95
Date Drilled:	05/03/95	Surface Elevation:	1422.28 ft.
Drilling Method:	Hollow-Stem Auger		

Depth (ft.)	Blows/6"	% Recovery	Samples	Graphic	DESCRIPTION OF MATERIALS	FIELD SCREENING			
						PID	ATHA	-	-
4	30				Silt, little gravel (cobble) trace clay, trace sand (fine to medium) moist Dark brown (7.5 YR 3/3).	0	0		
10	75					-	-		
7									
10									
3									
5									
7									
7									
5	25	25			Gravel (cobble) and clay. Dark brown (7.5 YR 5/3).	0	0		
20	75					-	-		
25									
23									
8									
8		75							
11					Silt & sand (med-coarse), trace clay. Dark brown, very moist (7.5 YR 3/3).	0	0		
13									
8									
8									
10	13				Boring Terminated at 10 ft. Note: Intervals .5-2.5 and 5-7 were redrilled approx 1 foot from original location.				
14									
15									
20									

DULUTH, MINNESOTA, SITE 26

OPERATIONAL TECHNOLOGIES CORPORATION

Project No.:	1315-197	Sampling Method:	Split Spoon Sampler
Logged By:	Kathleen Merino	Depth Drilled:	7 ft.
Drilling Co.:	American Engineering Testing	Depth To Water:	7 ft.
Driller:	J. Turra	Date Measured:	05/04/95
Date Drilled:	05/03/95	Surface Elevation:	1421.61 ft.
Drilling Method:	Hollow-Stem Auger		

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DULUTH, MINNESOTA, SITE 26

**OPERATIONAL TECHNOLOGIES
CORPORATION**

Project No.:	1315-197	Sampling Method:	Split Spoon Sampler
Logged By:	Kathleen Merino	Depth Drilled:	7 ft.
Drilling Co.:	American Engineering Testing	Depth To Water:	7 ft.
Driller:	J. Turra	Date Measured:	05/04/95
Date Drilled:	05/03/95	Surface Elevation:	1422.21 ft.
Drilling Method:	Hollow-Stem Auger		

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O P T E C H

OPERATIONAL TECHNOLOGIES
CORPORATION

LOG OF BORING 026-04BH

Project No.: 1315-197
 Logged By: Kathleen Merino
 Drilling Co.: American Engineering Testing
 Driller: J. Turra
 Date Drilled: 05/03/95
 Drilling Method: Hollow-Stem Auger










Sampling Method: Split Spoon Sampler
 Depth Drilled: 10 ft.
 Depth To Water: 10 ft.
 Date Measured: 05/03/95
 Surface Elevation: 1423.90 ft.

Depth (ft.)	Blows/6"	% Recovery	Samples	Graphic	DESCRIPTION OF MATERIALS	FIELD SCREENING			
						PID	ATHA	-	-
5 6 9 12		70	X		Silt, trace sand (fine) trace gravel (cobble). Dry, Dark brown (7.5 YR 3/4).	0	0		
5 8 10 11 16		10	X		Sand (medium), some silt, little gravel (cobble) dry. Dark brown (7.5 YR 3/4).	0	0		
6 6 8 9 10		50	X		Same as above (slightly moist-wet).	0	0.2		
15 20					Boring Terminated at 10 ft.				

DULUTH, MINNESOTA, SITE 26

**OPERATIONAL TECHNOLOGIES
CORPORATION**

Project No.:	1315-197	Sampling Method:	Split Spoon Sampler
Logged By:	Kathleen Merino	Depth Drilled:	10 ft.
Drilling Co.:	American Engineering Testing	Depth To Water:	NA
Driller:	J. Turra	Date Measured:	05/03/95
Date Drilled:	05/03/95	Surface Elevation:	1424.77 ft.
Drilling Method:	Hollow-Stem Auger		

Depth (ft.)	Blows/6"	% Recovery	Samples	Graphic	DESCRIPTION OF MATERIALS	FIELD SCREENING			
						PID	ATHA	-	-
4 7 7 7	75				Silt and sand (fine), some gravel (cobble) dry. Dark brown (7.5 YR 3/4).	0	0		
5 3 21 19 5	75				Sand (fine to medium), some silt, trace gravel (cobble) Dry. Dark brown (7.5 YR 3/4).	0	0		
10 10 11 12	15				Sand (medium) and silt, some gravel (cobble). Slightly moist, dark brown (7.5 YR 3/3).	0	0.3		
10					Boring Terminated at 10 ft.				
15									
20									

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DULUTH, MINNESOTA, SITE 26

OPERATIONAL TECHNOLOGIES
CORPORATION

LOG OF BORING 026-06BH

Project No.:	1315-197	Sampling Method:	Split Spoon Sampler
Logged By:	Kathleen Merino	Depth Drilled:	12 ft.
Drilling Co.:	American Engineering Testing	Depth To Water:	NA
Driller:	J. Turra	Date Measured:	05/03/95
Date Drilled:	05/03/95	Surface Elevation:	1425.43 ft.
Drilling Method:	Hollow-Stem Auger		

Depth (ft.)	Blows/6"	% Recovery	Samples	Graphic	DESCRIPTION OF MATERIALS	FIELD SCREENING			
						PID	ATHA	-	-
7 9 9 7		70			Silt and sand (fine), some gravel (cobble), loose, dark brown (7.5 YR 3/4).	0	0		
5 11 13 10 10		75			Silt, little gravel (cobble) trace clay, trace sand (fine) slightly moist, dark brown (7.5 YR 4/4).	0	0		
17 14 17 21		0			No recovery	0	0		
10 9 15 20 21		90			Silt and clay, traces and (fine to coarse), trace to little gravel, moist, dark brown (7.5 YR 3/4).	0	0		
15					Boring Terminated at 12 ft.				

DULUTH, MINNESOTA, SITE 25

**OPERATIONAL TECHNOLOGIES
CORPORATION**

Project No.:	1315-197	Sampling Method:	Split-Spoon Sampler
Logged By:	Kathleen Merino	Depth Drilled:	39.8 ft.
Drilling Co.:	American Engineering Testing	Depth To Water:	32.4 ft.
Driller:	J. Tuura	Date Measured:	05/10/95
Date Drilled:	05/10/95	Surface Elevation:	1422.59 ft.
Drilling Method:	Hollow Stem Auger	TOC Elevation:	1422.56 ft.

Depth (ft.)	Blows/6"	% Recovery	Samples	Graphic	DESCRIPTION OF MATERIALS	FIELD SCREENING				Monitoring Well
						PID (ppm)	ATHA (ppm)	BTEX (ppb)	Benzene (ppb)	
3		50	X	[Pattern]	Asphalt	0	0			[Pattern]
4			X	[Pattern]	Silt, trace sand (fine), trace clay, trace gravel (up to pebble) moist Dark brown (7.5 YR 4/4).					[Pattern]
4			X	[Pattern]						[Pattern]
5			X	[Pattern]						[Pattern]
5	2	50	X	[Pattern]	Silt, trace sand (fine to medium) trace gravel (up to pebble) dry Dark brown.	0	0			[Pattern]
5	5		X	[Pattern]						[Pattern]
16	16		X	[Pattern]						[Pattern]
16	16		X	[Pattern]						[Pattern]
10	6	60	X	[Pattern]	Silt, trace sand (fine), trace gravel, (up to pebble), trace clay Soft, brittle Brown (7.5 YR 5/3). Slightly Moist	0	0			[Pattern]
10	3		X	[Pattern]						[Pattern]
10	4		X	[Pattern]						[Pattern]
10	7		X	[Pattern]						[Pattern]
15	11	100	X	[Pattern]	Silt, trace sand (fine), trace clay, trace gravel (up to cobble) Dry. Dark brown (7.5 YR 4/4).	0	0			[Pattern]
15	16		X	[Pattern]						[Pattern]
18	18		X	[Pattern]						[Pattern]
18	18		X	[Pattern]						[Pattern]
20	7	60	X	[Pattern]	Silt, trace clay, trace sand (fine). Dark brown (7.5 YR 4/4).	0	0			[Pattern]
20	13		X	[Pattern]						[Pattern]

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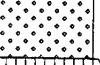














DULUTH, MINNESOTA, SITE 25

O P T E C H

OPERATIONAL TECHNOLOGIES
CORPORATION

LOG OF BORING 025-01MW

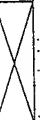


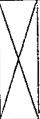


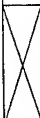






Project No.:	1315-197	Sampling Method:	Split-Spoon Sampler
Logged By:	Kathleen Merino	Depth Drilled:	39.8 ft.
Drilling Co.:	American Engineering Testing	Depth To Water:	32.4 ft.
Driller:	J. Tuura	Date Measured:	05/10/95
Date Drilled:	05/10/95	Surface Elevation:	1422.59 ft.
Drilling Method:	Hollow Stem Auger	TOC Elevation:	1422.56 ft.

Depth (ft.)	Blows/6"	% Recovery	Samples	Graphic	DESCRIPTION OF MATERIALS	FIELD SCREENING				Monitoring Well
						PID (ppm)	ATHA (ppm)	BTEX (ppb)	Benzene (ppb)	
37	50		X		Sand (medium to coarse) and silt, trace gravel. Dark brown (7.5 YR 4/4).					
25	14	75	X		Sand (fine to coarse) and granular, little gravel (up to cobble). Dark brown (7.5 YR 4/4) wet.	0	0			
20	20		X		Silt, trace sand (fine), trace gravel-firm. Dry. Dark brown (7.5 YR 4/4).					
24	7									
30	11	50	X		Silt, trace sand (fine). trace gravel (up to cobble) firm. Slightly moist. Dark brown (7.5 YR 4/4).	0	0			
13										
19										
35	8	60	X		Same as above (moist to saturated).	0	0			
11										
17										
18										
40					Boring Terminated at 39.8 ft.					

DULUTH, MINNESOTA, SITE 25

**OPERATIONAL TECHNOLOGIES
CORPORATION**

Project No.:	1315-197	Sampling Method:	Split-Spoon Sampler
Logged By:	Kathleen Merino	Depth Drilled:	17.0 ft.
Drilling Co.:	American Engineering Testing	Depth To Water:	6.0 ft.
Driller:	J. Tuura	Date Measured:	05/11/95
Date Drilled:	05/10/95	Surface Elevation:	1397.83 ft.
Drilling Method:	Hollow Stem Auger	TOC Elevation:	1400.21 ft.

Depth (ft.)	Blows/6"	% Recovery	Samples	Graphic	DESCRIPTION OF MATERIALS	FIELD SCREENING				Monitoring Well
						PID (ppm)	ATHA (ppm)	BTEX (ppb)	Benzene (ppb)	
3 5 7 11		60			Silt, some sand (medium). Dry dark brown (7.5 YR 4/4).	0	0			
5 3 4 7 8		60			Same as above.	0	0			
10 6 8 11 11		60			Silt, trace sand (fine), trace gravel (up to cobble). Dry to very moist. Dark brown (7.5 YR 4/4).	0	0			
15 2 3 6 8		60			Silt, trace sand (fine), trace clay, trace gravel (up to pebble) wet. Dark brown (7.5 YR 4/4).	0	0			
					Boring Terminated at 17 ft.					

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DULUTH, MINNESOTA, SITE 25

O P T E C H

OPERATIONAL TECHNOLOGIES
CORPORATION

LOG OF BORING 025-03MW

Project No.: 1315-197
 Logged By: Kathleen Merino
 Drilling Co.: American Engineering Testing
 Driller: J. Tuura
 Date Drilled: 05/11/95
 Drilling Method: Hollow Stem Auger

Sampling Method: Split-Spoon Sampler
 Depth Drilled: 22.0 ft.
 Depth To Water: 12.7 ft.
 Date Measured: 05/11/95
 Surface Elevation: 1402.71 ft.
 TOC Elevation: 1405.32 ft.

Depth (ft.)	Blows/6"	% Recovery	Samples	Graphic	DESCRIPTION OF MATERIALS	FIELD SCREENING				Monitoring Well
						PID (ppm)	ATHA (ppm)	BTEX (ppb)	Benzene (ppb)	
3 4 7 9		60	X		Silt, little sand (fine to coarse) trace gravel (up to cobble). Soft Moist. Dark brown (7.5 YR 4/4).	0	0			
5 11 11 24 14		60	X		Silt, trace sand (fine), trace gravel (up to pebble). dry. Soft. Dark brown (7.5 YR 4/4).	0	0			
10 11 11 7 7		25	X		Silt, little sand (fine to coarse), trace gravel (up to cobble). Brown (7.5 YR 3/4).	.8	25.8			
15 5 1 2 2		75	X		Clay, wood fragments & peat. Moist. Black (10 YR 2/1).	15.6	5			
20 1 1		50	X		Silt, sand lenses (1-2" thick). Trace clay, trace gravel (up to cobble). high organics and	0	0.8			

DULUTH, MINNESOTA, SITE 25

**OPERATIONAL TECHNOLOGIES
CORPORATION**

Project No.:	1315-197	Sampling Method:	Split-Spoon Sampler
Logged By:	Kathleen Merino	Depth Drilled:	22.0 ft.
Drilling Co.:	American Engineering Testing	Depth To Water:	12.7 ft.
Driller:	J. Tuura	Date Measured:	05/11/95
Date Drilled:	05/11/95	Surface Elevation:	1402.71 ft.
Drilling Method:	Hollow Stem Auger	TOC Elevation:	1405.32 ft.

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DULUTH, MINNESOTA, SITE 26

O P T E C H

OPERATIONAL TECHNOLOGIES
CORPORATION

LOG OF BORING 026-01MW

Project No.:	1315-197	Sampling Method:	Split-Spoon Sampler
Logged By:	Kathleen Merino	Depth Drilled:	26.0 ft.
Drilling Co.:	American Engineering Testing	Depth To Water:	17.2 ft.
Driller:	J. Tuura	Date Measured:	05/05/95
Date Drilled:	05/05/95	Surface Elevation:	1424.69 ft.
Drilling Method:	Hollow Stem Auger	TOC Elevation:	1424.62 ft.

Depth (ft.)	Blows/6"	% Recovery	Samples	Graphic	DESCRIPTION OF MATERIALS	FIELD SCREENING				Monitoring Well
						PID (ppm)	ATHA (ppm)	BTEX (ppb)	Benzene (ppb)	
	5	60	X		Asphalt	0	0			
	5		X		Silt, some gravel (fine to medium), trace gravel (up to cobble), moist dark red-brown (7.5 YR 4/4).					
	5		X							
	5		X							
5	15	80	X		Silt, some gravel (up to cobble), trace sand (fine), dry. Dark brown (7.5 YR 4/4).	0	0			
	20		X							
	15		X							
	14		X							
10	4	30	X		Silt, trace clay, trace gravel (up to cobble), trace sand (fine-coarse) Moist. Dark brown (7.5 YR 4/4).	0	0			
	2		X							
	3		X							
	4		X							
	8	80	X		Silt, trace little clay, trace sand (fine to coarse) trace gravel (up to cobble) very moist dark brown (7.15 YR 4/4).	0	0			
	11		X							
	13		X							
	40		X							
15	6	80	X		Same as above.	0	0			
	10		X							
	11		X							
	13		X							
20	11	60	X		Silt and sand (fine to medium) Dark brown.	0	0			
	9		X							

DULUTH, MINNESOTA, SITE 26

OPERATIONAL TECHNOLOGIES CORPORATION

Sampling Method:	Split-Spoon Sampler
Depth Drilled:	26.0 ft.
Depth To Water:	17.2 ft.
Date Measured:	05/05/95
Surface Elevation:	1424.69 ft.
TOC Elevation:	1424.62 ft.

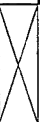
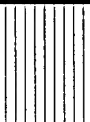


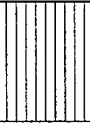


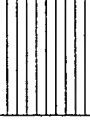


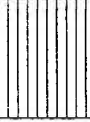




Depth (ft.)	Blows/6"	% Recovery	Samples	Graphic	DESCRIPTION OF MATERIALS	FIELD SCREENING				Monitoring Well
						PID (ppm)	ATHA (ppm)	BTEX (ppb)	Benzene (ppb)	
8 11			X		Sand and granular, some gravel (pebble-cobble) poorly sorted. Dark brown.					
8 9 13 19	70	X		Silt, little-trace sand (fine to coarse) trace clay, Grain size decreasing downward, wet. Dark brown (7.5 YR 4/4).	-	-				
Boring terminated at 26 ft. Note: Boulder encountered at 18.5 ft BLS.										

DULUTH, MINNESOTA, SITE 26

OPERATIONAL TECHNOLOGIES CORPORATION

Project No.:	1315-197
Logged By:	Kathleen Merino
Drilling Co.:	American Engineering Testing
Driller:	J. Tuura
Date Drilled:	05/06/95
Drilling Method:	Hollow Stem Auger

Sampling Method:	Split-Spoon Sampler
Depth Drilled:	22.0 ft.
Depth To Water:	11.3 ft.
Date Measured:	05/08/95
Surface Elevation:	1421.90 ft.
TOC Elevation:	1424.28 ft.

Depth (ft.)	Blows/6"	% Recovery	Samples	Graphic	DESCRIPTION OF MATERIALS	FIELD SCREENING				Monitoring Well
						PID (ppm)	ATHA (ppm)	BTEX (ppb)	Benzene (ppb)	
2 3 7 7 5	50 50	50			Asphalt	0	0			
					Silt, little sand (fine to medium), trace gravel (up to cobble) dry dark brown (7.5 YR 3/4).					
5 9 11 16 14	25	25			Same as above, slightly moist.	0	0			
10 8 19 14 17	60	60			Same as above, very moist to saturated.	0	0			
15 7 4 4 7					Silt, little to some clay, trace sand, trace gravel, fine to coarse grained sand, pebble sized clasts.					
20 4 5	45	45			Silt and sand; little to some gravel, trace clay, fine to coarse grained sand, pebble					

DULUTH, MINNESOTA, SITE 26

**OPERATIONAL TECHNOLOGIES
CORPORATION**

Sampling Method:	Split-Spoon Sampler
Depth Drilled:	22.0 ft.
Depth To Water:	11.3 ft.
Date Measured:	05/08/95
Surface Elevation:	1421.90 ft.
TOC Elevation:	1424.28 ft.

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DULUTH, MINNESOTA, SITE 26



































O P T E C H

OPERATIONAL TECHNOLOGIES
CORPORATION

LOG OF BORING 026-03MW

Project No.: 1315-197
 Logged By: Kathleen Merino
 Drilling Co.: American Engineering Testing
 Driller: J. Tuura
 Date Drilled: 05/06/95
 Drilling Method: Hollow Stem Auger

Sampling Method: Split-Spoon Sampler
 Depth Drilled: 17.0 ft.
 Depth To Water: 6.3 ft.
 Date Measured: 05/06/95
 Surface Elevation: 1420.44 ft.
 TOC Elevation: 1422.90 ft.

Depth (ft.)	Blows/6"	% Recovery	Samples	Graphic	DESCRIPTION OF MATERIALS	FIELD SCREENING				Monitoring Well
						PID (ppm)	ATHA (ppm)	BTEX (ppb)	Benzene (ppb)	
2	2	25	X		Asphalt	0	0			
3	3		X		Silt, some sand (fine) trace clay, wet, dark brown (7.5 YR 4/4).					
4	4		X							
6	6		X							
5	48		X		Sand and gravel, trace granular, little silt, wet, fine-grained to coarse-grained sand, dark brown (7.5 YR 4/4).	0	0			
	16		X							
	19		X							
	20		X							
10	45	50	X		Same as above.	0	0			
	15		X							
	23		X							
	24		X							
15	1	75	X		Same as above.	0	0			
	8		X							
	10		X							
	12		X							
					Boring Terminated at 17 ft.					
20										

APPENDIX B

FIELD GAS CHROMATOGRAPH ANALYSIS RESULTS

INTRODUCTION

This appendix describes the field gas chromatography (GC) analysis results of the Site Investigation (SI) for IRP Sites No. 25 and No. 26 at the Minnesota Air National Guard Base, Duluth, Minnesota. A PHOTOVAC 10S Plus portable gas chromatograph was used for field analysis. A summary of the GC results is presented in Table B.1, followed by the raw data.

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Table B.1
Field Gas Chromatograph Results – IRP Sites No. 25 and No. 26
148th FW, Duluth ANGB, Duluth, Minnesota

Boring	Sample Interval (ft. BLS)	Sample Mass (grams)	Concentrations (ppb)					
			Benzene	Toluene	Ethyl- benzene	m,p- Xylene	o- Xylene	Total BTEX
4 May 1995								
100 ppb BTEX	—	—	100	100	100	200	100	600
1 ppm BTEX	—	—	1,000	1,000	1,000	2,000	1,000	6,000
10 ppm BTEX	—	—	10,000	10,000	10,000	20,000	10,000	60,000
Air Blank	—	—	10	4	8	14	9	45
026-004BH	0.5'-2.5'	10	11	4	5	9	4	33
	5'-7'	10	7	3	2	5	2	19
	8'-10'	10	1	2	2	4	3	12
026-001BH	0.5'-2.5'	10	7	1	3	17	26	54
	5'-7'	10	ND	2	ND	ND	ND	2
100 ppb BTEX	—	—	100	102	101	211	105	619
Air Blank	—	—	ND	1	ND	ND	ND	1
026-004BH Reshot	0.5'-2.5'	10	ND	2	1	14	11	28
026-001BH	8'-10'	10	ND	2	2	11	5	20
026-005BH	1.0'-1.5'	10	ND	2	ND	5	3	10
	6'-6.5'	10	ND	2	2	5	ND	9
	10'	10	ND	1	ND	2	1	4
100 ppb BTEX	—	—	93	89	83	171	95	531
Recal	—	—	100	100	100	200	100	600
Air Blank	—	—	ND	ND	1	ND	ND	1
026-006BH	0.5'-2.5'	10	7	2	2	4	4	19
	6'-6.5'	10	ND	1	ND	3	ND	4
	11'-11.5'	10	5	2	ND	4	2	13
026-002BH	0.5'-2.5'	10	ND	2	1	2	ND	5
	5'-7'	10	ND	1	ND	ND	ND	1
100 ppb BTEX	—	—	90	81	81	159	73	483
Recal	—	—	100	100	100	200	100	600
Air Blank	—	—	ND	ND	1	ND	ND	1
026-003BH	0.5'-2.5'	10	ND	2	1	8	2	13
	5'-7'	10	ND	2	ND	4	ND	6

Table B.1 (Continued)
Field Gas Chromatograph Results – IRP Sites No. 25 and No. 26
148th FW, Duluth ANGB, Duluth, Minnesota

Boring	Sample Interval (ft. BLS)	Sample Mass (grams)	Concentrations (ppb)					
			Benzene	Toluene	Ethyl- benzene	m,p- Xylene	o- Xylene	Total BTEX
4 May 1995 (Concluded)								
100 ppb BTEX	— —	— —	109 100	96 100	95 100	181 200	88 100	569 600
5 May 1995								
1 ppm BTEX	—	—	1,000	1,000	1,000	1,000	1,000	5,000
10 ppm BTEX	—	—	10,000	10,000	10,000	20,000	10,000	60,000
1 ppm BTEX	—	—	1,000	1,000	1,000	2,000	1,000	6,000
Air Blank	—	—	4	4	6	13	ND	27
026-001MW	1'-2'	10	ND	3	ND	ND	ND	3
	5'-7'	10	4	3	3	6	ND	16
	10'-12'	10	3	3	2	6	5	19
	12.5'-14.5'	10	3	3	3	9	8	26
	15'-17'	10	ND	ND	6	13	ND	19
100 ppb BTEX	—	—	100	96	106	216	115	633
Air Blank	—	—	ND	1	ND	ND	ND	1
026-001MW	20'-22'	10	ND	2	1	4	ND	7
	24'-26'	10	ND	2	1	3	ND	6
100 ppb BTEX	—	—	84	90	102	215	174	665
	—	—	100	100	100	200	100	600
6 May 1995								
1 ppm BTEX	—	—	1,000	1,000	1,000	2,000	1,000	6,000
10 ppm BTEX	—	—	10,000	10,000	10,000	20,000	10,000	60,000
Air Blank	—	—	4	3	8	21	ND	36
026-003MW	0.5'-2.5'	10	5	4	6	26	5	46
	5'-7'	10	3	3	10	25	27	68
	10'-12'	10	3	3	11	32	28	77
026-002MW	0.5'-2.5'	10	ND	3	12	31	32	78
	5'-7'	10	ND	2	3	15	17	37
100 ppb BTEX	—	—	100	90	86	169	78	523
Recal	—	—	100	100	100	200	100	600
Air Blank	—	—	ND	1	ND	ND	ND	1
026-002MW	10'-12'	10	1	3	3	9	7	23
	15'-17'	10	3	3	2	7	4	19

Table B.1 (Continued)
Field Gas Chromatograph Results – IRP Sites No. 25 and No. 26
148th FW, Duluth ANGB, Duluth, Minnesota

Boring	Sample Interval (ft. BLS)	Sample Mass (grams)	Concentrations (ppb)					
			Benzene	Toluene	Ethyl- benzene	m,p- Xylene	o- Xylene	Total BTEX
6 May 1995 (Concluded)								
100 ppb BTEX	— —	— —	100 100	94 100	91 100	185 200	97 100	567 600
8 May 1995								
1 ppm BTEX	—	—	1,000	1,020	1,010	2,030	1,290	6,350
10 ppm BTEX	—	—	10,000	10,000	10,000	20,000	10,000	60,000
Air Blank	—	—	2	8	7	13	14	44
026-002MW	20'-22'	10	4	6	7	13	11	41
100 ppb BTEX	— —	— —	99 100	80 100	72 100	133 200	47 100	431 600
11 May 1995								
1 ppm BTEX	—	—	1,000	1,000	1,000	2,000	1,000	6,000
10 ppm BTEX	—	—	10,000	10,000	10,000	20,000	10,000	60,000
Air Blank	—	—	8	18	22	51	21	120
025-001MW	0.5'-2.5'	10	6	6	8	18	ND	38
	5'-7'	10	1	4	8	21	ND	34
	10'-12'	10	2	4	13	19	ND	38
	15'-17'	10	1	4	3	11	ND	19
	20'-22'	10	1	4	3	8	ND	16
100 ppb BTEX	—	—	91	87	89	193	87	547
Recal	—	—	100	100	100	200	100	600
Air Blank	—	—	ND	2	2	ND	ND	4
025-001MW	25'-27'	10	3	4	2	5	ND	14
	30'-32'	10	3	4	5	9	ND	21
	35'-37'	10	ND	4	18	29	ND	51
025-002MW	0.5'-2.5'	10	ND	4	2	7	ND	13
	5'-7'	10	3	4	1	3	ND	11
100 ppb BTEX	—	—	108	104	104	212	108	636
Air Blank	—	—	ND	1	1	ND	ND	2
025-002MW	10'-12'	10	4	4	2	7	4	21
	15'-17'	10	ND	4	1	4	3	12
100 ppb BTEX	—	—	86	85	81	166	83	501

Table B.1 (Continued)
Field Gas Chromatograph Results – IRP Sites No. 25 and No. 26
148th FW, Duluth ANGB, Duluth, Minnesota

Boring	Sample Interval (ft. BLS)	Sample Mass (grams)	Concentrations (ppb)					
			Benzene	Toluene	Ethyl- benzene	m,p- Xylene	o- Xylene	Total BTEX
11 May 1995 (Concluded)								
Recal	—	—	100	100	100	200	100	600
Air Blank	—	—	ND	1	ND	27	ND	28
025-003MW	0.5'-2.5'	10	ND	5	3	13	9	30
	5'-7'	10	25	4	2	15	ND	46
	10'-12'	10	774	350	297	1,840	827	4,090
025-003MW Reshot	10'-12'	10	665	515	540	2,220	985	4,930
025-003MW	15'-17'	10	2,220	140	ND	ND	ND	2,360
1 ppm BTEX	—	—	696	679	658	1,389	586	4,008
Recal	—	—	1,000	1,000	1,000	2,000	1,000	6,000
Air Blank	—	—	ND	1	1	3	ND	5
025-003MW	20'-22'	10	149	15	9	25	16	214
Air Blank	—	—	ND	1	1	2	ND	4
13 May 1995								
100 ppb BTEX	—	—	100	100	100	200	100	600
1 ppm BTEX	—	—	1,000	1,000	1,000	2,000	1,000	6,000
10 ppm BTEX	—	—	10,000	10,000	10,000	20,000	10,000	60,000
Air Blank	—	—	4	3	8	14	ND	29
025-009BH	0.5'-2.5'	10	4	4	4	9	ND	21
	5'-7'	10	3	4	3	2	ND	12
	10'-12'	10	3	3	ND	ND	ND	6
025-011BH	0.5'-2.5'	10	2	3	1	4	ND	10
	5'-7'	10	ND	4	2	6	ND	12
100 ppb BTEX	—	—	106	100	101	207	99	613
Air Blank	—	—	ND	1	ND	3	ND	4
025-008BH	0.5'-2.5' 7'-9'	10 10	ND 36	3 92	1 635	3 645	ND 9,450	7 10,858
025-008BH Reshot	7'-9'	10	35	110	630	790	4,030	5,595
025-008BH	9'-11'	10	ND	ND	ND	ND	ND	ND

Table B.1 (Continued)
Field Gas Chromatograph Results – IRP Sites No. 25 and No. 26
148th FW, Duluth ANGB, Duluth, Minnesota

Boring	Sample Interval (ft. BLS)	Sample Mass (grams)	Concentrations (ppb)					
			Benzene	Toluene	Ethyl- benzene	m,p- Xylene	o- Xylene	Total BTEX
13 May 1995 (Concluded)								
025-008BH Reshot	9'-11'	10	4	4	12	ND	60	80
100 ppb BTEX	—	—	108	95	101	214	144	662
Recal	—	—	100	100	100	200	100	600
Air Blank	—	—	1	2	1	2	ND	6
025-008BH	13'-15'	10	ND	3	2	ND	ND	5
025-010BH	0.5'-2.5'	10	ND	3	7	17	9	36
	5'-7'	10	3	3	1	3	2	12
025-006BH	0.5'-2.5'	10	ND	3	1	3	1	8
	5'-7'	10	ND	3	1	3	1	8
100 ppb BTEX	—	—	89	97	88	159	34	467
Recal	—	—	100	100	100	200	100	600
Air Blank	—	—	ND	12	ND	3	ND	15
025-006BH	10'-12'	10	ND	5	5	ND	14	24
	20'-22'	10	3	32	35	ND	78	148
100 ppb BTEX	—	—	93	92	96	193	101	575
	—	—	100	100	100	200	100	600
15 May 1995								
1 ppm BTEX	—	—	1,000	1,000	1,000	2,000	1,000	6,000
10 ppm BTEX	—	—	10,000	10,000	10,000	20,000	10,000	60,000
Air Blank	—	—	2	1	3	4	ND	10
1 ppm BTEX	—	—	827	778	664	1,300	632	4,201
Recal	—	—	1,000	1,000	1,000	2,000	1,000	6,000
Air Blank	—	—	1	2	3	3	ND	9
025-003BH	0.5'-2.5'	10	7	10	41	ND	82	140
	5'-7'	10	ND	ND	3,620	35,650	15,050	54,320
025-003BH Re-Reshot	5'-7'	10	ND	23,950	3,740	13,700	20,150	61,540
025-003BH	10'-12'	10	ND	47,550	5,200	36,450	27,000	116,200
10 ppm BTEX	—	—	8,720	8,470	5,510	11,620	5,810	40,130

Table B.1 (Continued)
Field Gas Chromatograph Results – IRP Sites No. 25 and No. 26
148th FW, Duluth ANGB, Duluth, Minnesota

Boring	Sample Interval (ft. BLS)	Sample Mass (grams)	Concentrations (ppb)					
			Benzene	Toluene	Ethyl- benzene	m,p- Xylene	o- Xylene	Total BTEX
15 May 1995 (Concluded)								
Recal	—	—	10,000	10,000	10,000	20,000	10,000	60,000
Air Blank	—	—	11	5	11	25	ND	52
025-003BH	15'-17' 20'-22'	10	140	215	205	1,140	420	2,120
		10	276	314	246	1,832	1,110	3,778
025-003BH Reshot	25'	10	20	276	42	364	47	749
025-002BH	0.5'-2.5'	10	13	152	12	31	ND	208
1 ppm BTEX	—	—	900	828	718	1,440	824	4,710
Recal	—	—	1,000	1,000	1,000	2,000	1,000	6,000
Air Blank	—	—	ND	2	3	6	ND	11
025-002BH Reshot	5'-7'	10	5,800,000	263,000	25,500	205,000	114,000	6,407,500
025-002BH	10'-12'	10	20,200	214,000	2,700	156,000	104,000	496,900
025-002BH Re-Reshot	5'-7'	10	73,800	209,000	3,360	145,000	93,000	524,160
10 ppm BTEX	—	—	9,050	8,790	8,290	16,840	8,390	51,360
Recal	—	—	10,000	10,000	10,000	20,000	10,000	60,000
Air Blank	—	—	11	38	41	521	103	714
	—	—	3	4	1	3	ND	11
025-001BH	0.5'-2.5' 5'-7'	10 10	60 ND	207 613,000	27 6,600	107 387,000	ND 180,000	401 1,186,600
10 ppm BTEX	—	—	10,940	9,800	8,540	16,560	7,750	53,590
16 May 1995								
100 ppb BTEX	—	—	100	100	100	200	100	600
1 ppm BTEX	—	—	1,000	1,000	1,000	2,000	1,010	6,010
10 ppm BTEX	—	—	10,000	10,000	10,000	20,000	10,000	60,000
Air Blank	—	—	ND	9	5	6	ND	20

Table B.1 (Continued)
Field Gas Chromatograph Results – IRP Sites No. 25 and No. 26
148th FW, Duluth ANGB, Duluth, Minnesota

Boring	Sample Interval (ft. BLS)	Sample Mass (grams)	Concentrations (ppb)					
			Benzene	Toluene	Ethyl- benzene	m,p- Xylene	o- Xylene	Total BTEX
16 May 1995 (Concluded)								
025-007BH	0.5'-2.5'	10	2	6	1	3	ND	12
	5'-7'	10	5	12	5	14	ND	36
	10'-12'	10	4	4	ND	ND	ND	8
	15'-17'	10	4	11	1	ND	ND	16
	20'-22'	10	ND	4	1	ND	21	26
100 ppb BTEX	—	—	101	83	54	75	1	314
Recal	—	—	100	100	100	200	100	600
Air Blank	—	—	ND	5	ND	ND	ND	5
025-005BH	0.5'-2.5'	10	2	4	ND	9	ND	14
	10'-12'	10	ND	4	2	ND	ND	6
	20'-22'	10	3	4	1	9	ND	17
025-004BH	0.5'-2.5'	10	ND	4	ND	ND	ND	4
	5'-7'	10	2	4	10	178	157	351
100 ppb BTEX	—	—	100	100	100	200	100	600
1 ppm BTEX	—	—	1,000	1,000	1,000	2,000	1,000	6,000
10 ppm BTEX	—	—	10,000	10,000	10,000	20,000	10,000	60,000
Air Blank	—	—	1	1	6	9	ND	17
025-004BH	10'-12'	10	1	4	4	8	ND	17
	18'-20'	10	1	3	ND	ND	ND	4
025-004BH Reshot	5'-7'	10	1	3	2	6	ND	12
100 ppb BTEX	—	—	106	103	98	188	68	563
	—	—	100	100	100	200	100	600
17 May 1995								
1 ppm BTEX	—	—	1,000	1,000	1,000	2,000	1,000	6,000
10 ppm BTEX	—	—	10,000	10,000	10,000	20,000	10,000	60,000
Air Blank	—	—	1	12	ND	83	20	116
100 ppb BTEX	—	—	97	70	62	119	51	399
Recal	—	—	100	100	100	200	100	600
Air Blank	—	—	3	ND	1	ND	ND	4
025-012BH	0.5'-2.5'	10	3	21	17	ND	39	80
	5'-7'	10	ND	ND	ND	ND	ND	ND

Table B.1 (Concluded)
Field Gas Chromatograph Results – IRP Sites No. 25 and No. 26
148th FW, Duluth ANGB, Duluth, Minnesota

Boring	Sample Interval (ft. BLS)	Sample Mass (grams)	Concentrations (ppb)					
			Benzene	Toluene	Ethyl- benzene	m,p- Xylene	o- Xylene	Total BTEX
17 May 1995 (Concluded)								
025-012BH Reshot	5'-7'	10	ND	ND	ND	ND	ND	ND
025-012BH	10'-12'	10	48	31	4	ND	14	97
	18'-20'	10	41	46	ND	ND	ND	87
100 ppb BTEX	—	—	77	84	80	151	78	470
Recal	—	—	100	100	100	200	100	600
Air Blank	—	—	3	ND	1	ND	73	77
025-013BH	0.5'-2.5'	10	4	3	1	3	ND	11
	5'-7'	10	3	2	20	ND	106	131
	10'-12'	10	4	2	4	2	ND	12
	18'-20'	10	10	17	3	ND	4	34
100 ppb BTEX	—	—	96	92	87	178	93	546
	—	—	100	100	100	200	100	600
20 May 1995								
1 ppm BTEX	—	—	1,000	1,000	1,000	2,000	1,000	6,000
10 ppm BTEX	—	—	10,000	10,000	10,000	20,000	10,000	60,000
Air Blank	—	—	13	5	28	40	95	181
026-001MW	Water	10 ml	10	2	3	ND	ND	15
026-002MW	Water	10 ml	1	ND	ND	ND	ND	1
026-003MW	Water	10 ml	ND	ND	ND	ND	ND	ND
025-001MW	Water	10 ml	ND	ND	ND	ND	ND	ND
025-002MW	Water	10 ml	4	ND	ND	ND	ND	4
100 ppb BTEX	—	—	109	97	92	178	77	553
Recal	—	—	100	100	100	200	100	600
Air Blank	—	—	ND	ND	ND	ND	ND	ND
025-003MW	Water	10 ml	1,920	963	318	1,400	1,090	5,690
1 ppm BTEX	—	—	1,020	1,040	1,110	2,300	1,130	6,600

MW – Monitor Well.
BH – Borehole.
ml – milliliters.
Recal – Recalibration.

ppb – parts per billion.
ppm – parts per million.
ND – Non-Detect.

ft. BLS – feet Below Land Surface.
BTEX – Benzene, Toluene,
Ethylbenzene, and Xylenes.

Table B.2
PID Screening Results – IRP Sites No. 25 and No. 26
148th FW, Duluth ANGB, Duluth International Airport, Duluth, Minnesota

Boring	Interval (ft. BLS)	PID Screening Results	ATHA Screening Results
025-01BH	0.5-2.5	0	0
	5.0-7.0	742	1,096
025-02BH	0.5-2.5	0	58
	5.0-7.0	541	1,391
	10.0-12.0	330	1,339
025-03BH	0.5-2.5	0	0
	5.0-7.0	0	467
	10.0-12.0	273	727
	15.0-17.0	133	53
	20.0-22.0	9.5	10.6
	23.0-25.0	0	0
025-04BH	0.5-2.5	0	0
	5.0-7.0	0	0
	10.0-12.0	0	0
	18.0-20.0	0	0
025-05BH	0.5-2.5	0	0
	5.0-7.0	0	0
	10.0-12.0	0	0
	20.0-22.0	0	0
025-06BH	0.5-2.5	0	0
	5.0-7.0	0	0
	10.0-12.0	NA	NA
	20.0-22.0	0.7	0
025-07BH	0.5-2.5	0	0
	5.0-7.0	0	0
	10.0-12.0	0	0
	15.0-17.0	0	0
	20.0-22.0	0	0
025-08BH	0.5-2.5	0	0
	7.0-9.0	2	12.4
	9.0-11.0	0.5	0
	13.0-15.0	0	0
025-09BH	0.5-2.5	0	0
	5.0-7.0	0	0
	10.0-12.0	0	0
	13.0-15.0	0	0
025-10BH	0.5-2.5	0	NA
	5.0-7.0	0	0
025-11BH	0.5-2.5	0	0
	5.0-7.0	0	NA

Table B.2 (Continued)
PID Screening Results – IRP Sites No. 25 and No. 26
148th FW, Duluth ANGB, Duluth, Minnesota

Boring	Interval (ft. BLS)	PID Screening Results	ATHA Screening Results
025-12BH	0.5-2.5	0	2.8
	5.0-7.0	9.6	6.9
	10.0-12.0	7.5	6.5
	18.0-20.0	4.5	3.2
025-13BH	0.5-2.5	0	0
	5.0-7.0	0	0
	10.0-12.0	0	0
	18.0-20.0	0	10.6
025-01MW	0.5-2.5	0	0
	5.0-7.0	0	0
	10.0-12.0	0	0
	15.0-17.0	0	0
	20.0-22.0	0	0
	25.0-27.0	0	0
	30.0-32.0	0	0
	35.0-37.0	0	0
025-02MW	0.5-2.5	0	0
	5.0-7.0	0	0
	10.0-12.0	0	0
	15.0-17.0	0	0
025-03MW	0.5-2.5	0	0
	5.0-7.0	0	0
	10.0-12.0	0.8	25.8
	15.0-17.0	15.6	5
	20.0-22.0	0	0.8
026-01BH	0.5-2.5	0	0
	5.0-7.0	0	0
	8.0-10.0	0	0
026-02BH	0.5-2.5	0	0
	5.0-7.0	0	0
026-03BH	0.5-2.5	0	0
	5.0-7.0	0	0
026-04BH	0.5-2.5	0	0
	5.0-7.0	0	0
	8.0-10.0	0	0.2
026-05BH	0.5-2.5	0	0
	5.0-7.0	0	0
	8.0-10.0	0	0.3

Table B.2 (Concluded)
PID Screening Results – IRP Sites No. 25 and No. 26
148th FW, Duluth ANGB, Duluth, Minnesota

Boring	Interval (ft. BLS)	PID Screening Results	ATHA Screening Results
026-06BH	0.5-2.5	0	0
	5.0-7.0	0	0
	8.0-10.0	0	0
	10.0-12.0	0	0
026-01MW	0.5-2.5	0	0
	5.0-7.0	0	0
	10.0-12.0	0	0
	12.5-14.5	0	0
	15.0-17.0	0	0
	20.0-22.0	0	0
	24.0-26.0	NA	NA
026-02MW	0.5-2.5	0	0
	5.0-7.0	0	0
	10.0-12.0	0	0
	15.0-17.0	NA	NA
	20.0-22.0	NA	NA
026-03MW	0.5-2.5	0	0
	5.0-7.0	0	0
	10.0-12.0	0	0
	15.0-17.0	0	0

MW – Monitor Well.

BH – Borehole.

ft. BLS – feet Below Land Surface.

PID – Photoionization Detector.

ATHA – Ambient Temperature Headspace Analysis.

NA – Not Analyzed.

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ANALYSIS #1

10S+ GC FUNCTION ANALYSIS REPORT

0 2 4 6 8 10
(x 10 MV)

TIME PRINTED: MAY 4,95 12:03

SAMPLE TIME: MAY 4,95 11:55

METHOD

SLOPE UP 1.000 MV/SEC

SLOPE DOWN 3.000 MV/SEC

MIN AREA 0.000 MVSEC

MIN HEIGHT 0.000 MV

ANALYSIS DELAY 0.0 SEC

WINDOW PERCENT 10.0 %

DET FLOW 12 ML/MIN

B/F FLOW 12 ML/MIN

AUX FLOW 0 ML/MIN

OVEN TEMP 40 C

AMB TEMP 29 C

MAX GAIN 1000

ANALYSIS TIME 500.0 SEC

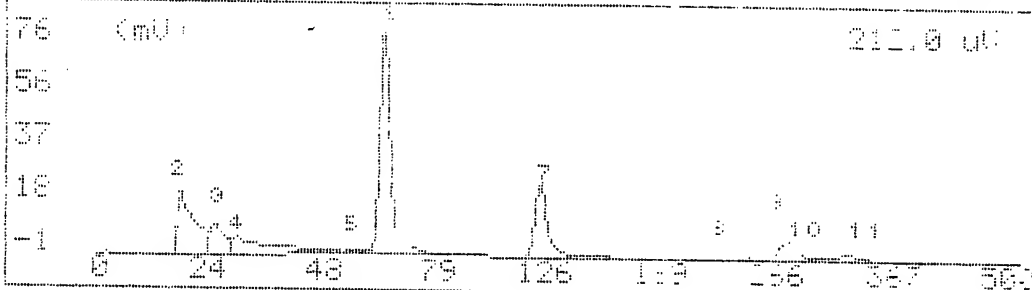
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.058 MVS	15.0
2	UNKNOWN	81.39 MVS	16.6
3	UNKNOWN	32.20 MVS	23.7
4	UNKNOWN	62.06 MVS	28.2
5	UNKNOWN	6.436 MVS	51.3
6	UNKNOWN	218.4 MVS	58.5
7	UNKNOWN	161.5 MVS	117.3
8	UNKNOWN	0.852 MVS	215.8
9	UNKNOWN	117.2 MVS	242.6
10	UNKNOWN	100.4 MVS	261.0
11	UNKNOWN	34.73 MVS	309.3

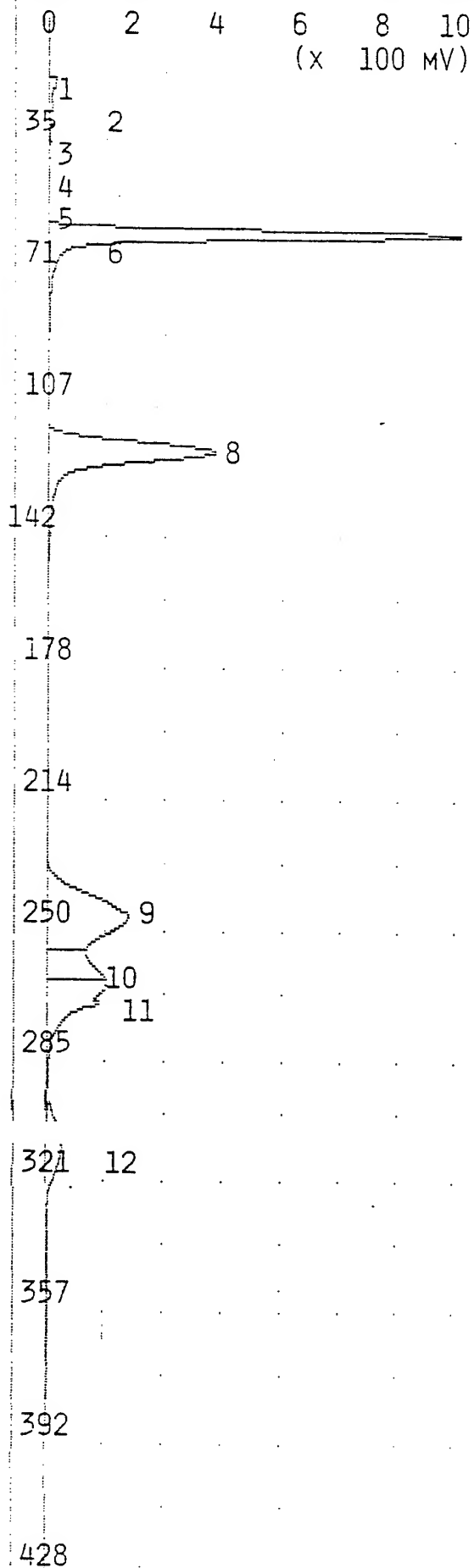
NOTES

JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX

G.C. Ready		105-30 Function	4.95	12:11
-- Analysis No 1		-- Run at --	95	11:55
Pk No	Name	Conc/Area	Height	Ret. Time
1	Unknown	12.20 mV	76	21.2 sec
2	Unknown	11.06 mV	56	22.2 sec
3	Unknown	1.436 mV	37	23.2 sec
4	benzene	100.0 ppb	18	24.2 sec
5	toluene	100.0 ppb	18	25.2 sec
6	Unknown	1.082 mV	18	26.2 sec
7	ethylbenzene	100.0 ppb	18	27.2 sec
8	m,p-xylene	100.0 ppb	18	28.2 sec
9	o-xylene	100.0 ppb	18	29.2 sec
- Detected 11 peaks. Use + + to scroll [



ANALYSIS #2 10S+ GC FUNCTION ANALYSIS REPORT

TIME PRINTED: MAY 4,95 12:22
SAMPLE TIME: MAY 4,95 12:14

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 30 C
MAX GAIN 1000
ANALYSIS TIME 500.0 SEC

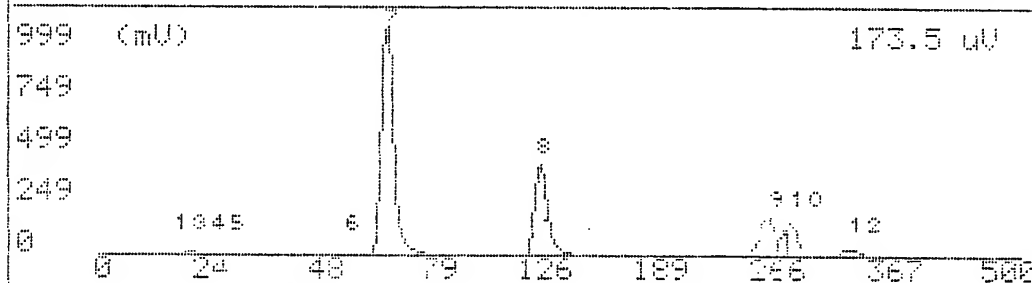
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.068 MVS	14.9
2	UNKNOWN	28.17 MVS	16.6
3	UNKNOWN	66.61 MVS	18.2
4	UNKNOWN	37.96 MVS	23.8
5	UNKNOWN	67.48 MVS	28.2
6	UNKNOWN	5.910 MVS	50.8
7	BENZENE	1.730 PPM	59.0
8	TOLUENE	1.797 PPM	117.7
9	ETHYLBENZENE	2.311 PPM	243.4
10	M,P-XYLENE	1.977 PPM	261.8
11	UNKNOWN	1.319 VSEC	267.7
12	O-XYLENE	2.571 PPM	309.8

NOTES

JOE BYRD, JR.
DULUTH ANGB
1 PPM BTEX

G.C. Ready 195- EC Function: 4.95 24:27
 -- Analysis No 2 -- Run at - May 1.95 12:14
 Pk No Name Conc/Area Flag Ret. time
 4 Unknown 37.96 mUS - - 20.8 sec
 5 Unknown 67.49 mUS - - 20.8 sec
 6 Unknown 5.810 mUS - - 20.8 sec
 7 benzene 1.0000 ppm - - 109.3 sec
 8 toluene 1.0000 ppm - - 111.1 sec
 9 ethylbenzene 1.0000 ppm - - 240.1 sec
 10 m,p-xylene 2.0000 ppm - - 261.2 sec
 11 Unknown 1.319 Usec - - 267.4 sec
 12 o-xylene 1.0002 ppm - - 309.3 sec
 - Detected 12 peaks. Use + + to scroll [583 sec]



ANALYSIS #3

10S+ GC FUNCTION ANALYSIS REPORT

0 2 4 6 8 10
(x 100 MV)

TIME PRINTED: MAY 4,95 12:38

SAMPLE TIME: MAY 4,95 12:30

METHOD

SLOPE UP 0.500 MV/SEC

SLOPE DOWN 1.500 MV/SEC

MIN AREA 0.000 MVSEC

MIN HEIGHT 0.000 MV

ANALYSIS DELAY 0.0 SEC

WINDOW PERCENT 10.0 %

DET FLOW 12 ML/MIN

B/F FLOW 12 ML/MIN

AUX FLOW 0 ML/MIN

OVEN TEMP 40 C

AMB TEMP 31 C

MAX GAIN 1000

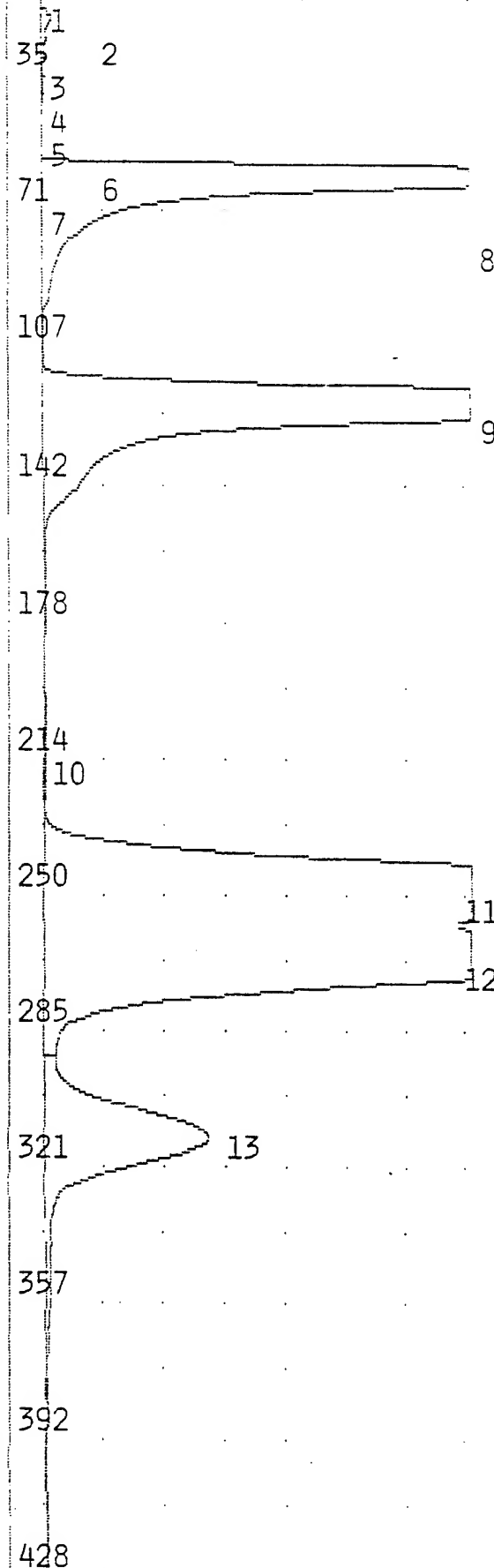
ANALYSIS TIME 500.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.082 MVS	15.0
2	UNKNOWN	21.60 MVS	16.8
3	UNKNOWN	98.39 MVS	18.4
4	UNKNOWN	49.99 MVS	24.0
5	UNKNOWN	65.05 MVS	28.4
6	UNKNOWN	11.28 MVS	43.6
7	UNKNOWN	4.007 MVS	51.2
8	BENZENE	5.510 PPM	60.2
9	TOLUENE	8.414 PPM	119.3
10	UNKNOWN	7.344 MVS	211.2
11	ETHYLBENZENE	10.08 PPM	246.6
12	M,P-XYLENE	39.30 PPM	262.9
13	O-XYLENE	7.916 PPM	311.4

NOTES

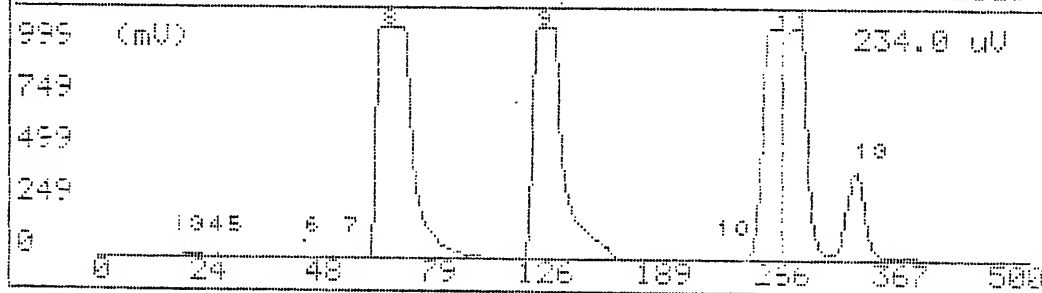
JOE BYRD, JR.
DULUTH ANGB
10 PPM BTEX

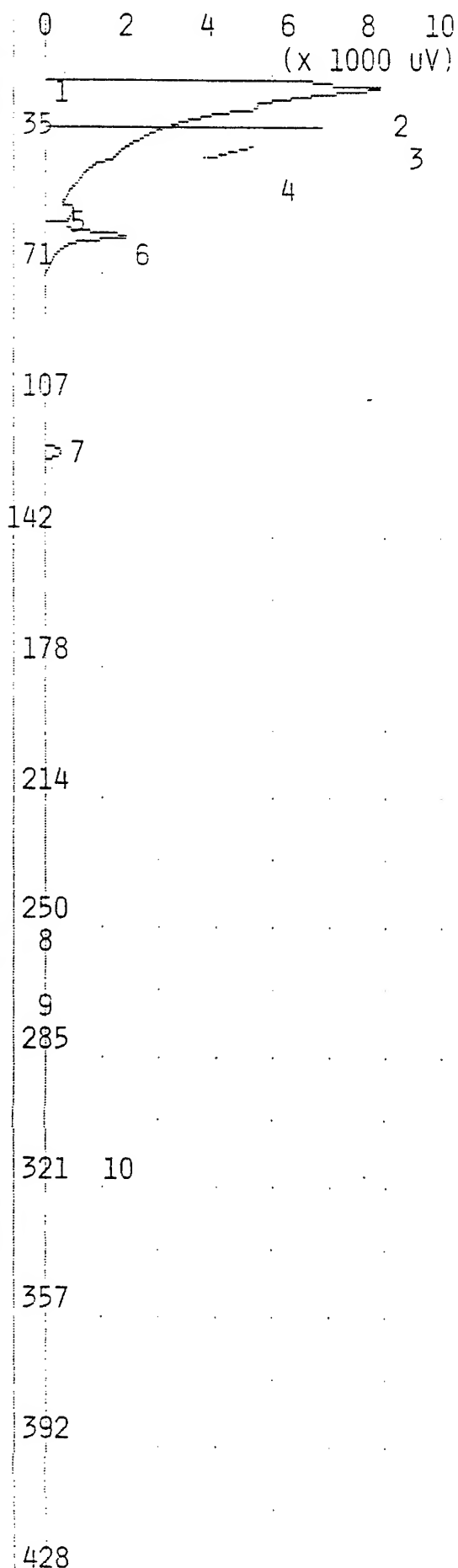


G.C. Ready 108+ GC Function Val 4.95 12:40
 -- Analysis No 3 -- Run at Mar 1, 95 12:30
 Pk No Name Conc/Area Alarm Ret. Time

1	Unknown	65.14 mUS	-No-	28.4 sec
2	Unknown	11.35 mUS	-No-	43.6 sec
3	Unknown	4.062 mUS	-No-	51.2 sec
4	benzene	10.00 ppm	-No-	60.2 sec
5	toluene	10.00 ppm	-No-	119.2 sec
6	Unknown	7.344 mUS	-No-	211.2 sec
7	ethylbenzene	10.00 ppm	-No-	246.6 sec
8	m,p-xylene	20.00 ppm	-No-	262.9 sec
9	o-xylene	10.01 ppm	-No-	311.4 sec

- Detected 13 peaks. Use + + to scroll [505 sec]





TIME PRINTED: MAY 4,95 12:54

SAMPLE TIME: MAY 4,95 12:46

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000

ANALYSIS TIME 500.0 SEC

PEAK REPORT

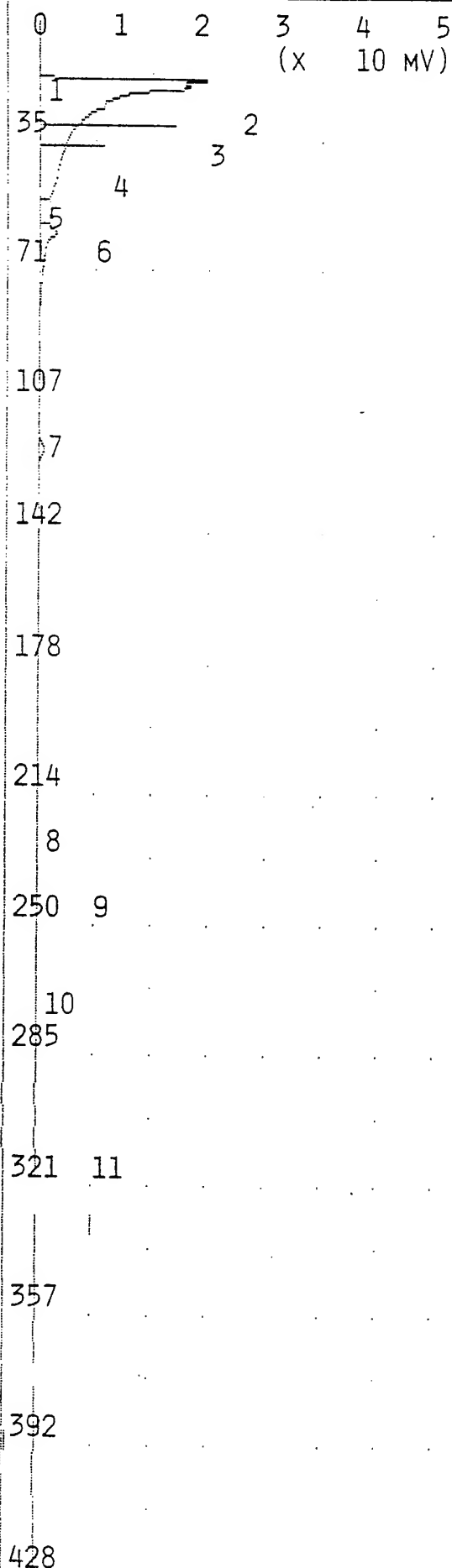
PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.061 MVS	14.8
2	UNKNOWN	9.807 MVS	16.8
3	UNKNOWN	110.7 MVS	18.3
4	UNKNOWN	0.645 MVS	23.8
5	UNKNOWN	0.851 MVS	51.3
6	BENZENE	10.25 PPB	58.8
7	TOLUENE	4.357 PPB	117.7
8	ETHYLBENZENE	8.333 PPB	244.2
9	M,P-XYLENE	14.48 PPB	262.1
10	O-XYLENE	9.373 PPB	308.8

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK

ANALYSIS #5

10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 4,95 13:06

SAMPLE TIME: MAY 4,95 12:57

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000
ANALYSIS TIME 500.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.123 MVS	15.1
2	UNKNOWN	29.36 MVS	16.7
3	UNKNOWN	72.78 MVS	18.2
4	UNKNOWN	102.5 MVS	23.8
5	UNKNOWN	10.26 MVS	50.8
6	BENZENE	10.92 PPB	58.8
7	TOLUENE	3.660 PPB	117.7
8	UNKNOWN	0.853 MVS	220.0
9	ETHYLBENZENE	4.590 PPB	244.0
10	M,P-XYLENE	8.939 PPB	264.0
11	O-XYLENE	3.716 PPB	311.2

NOTES

JOE BYRD, JR.

DULUTH ANGB

026-004BH 0.5-2.5 16

10g 33
J

0 1 2 3 4 5
(x 10 MV)

TIME PRINTED: MAY 4,95 13:18

SAMPLE TIME: MAY 4,95 13:10

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 32 C
MAX GAIN 1000
ANALYSIS TIME 500.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.437 MVS	14.2
2	UNKNOWN	26.13 MVS	16.7
3	UNKNOWN	56.24 MVS	18.2
4	UNKNOWN	94.17 MVS	23.7
5	UNKNOWN	10.21 MVS	50.8
6	BENZENE	7.368 PPB	58.7
7	TOLUENE	3.415 PPB	118.1
8	UNKNOWN	1.338 MVS	217.2
9	ETHYLBENZENE	1.945 PPB	245.3
10	M,P-XYLENE	4.567 PPB	262.6
11	O-XYLENE	2.291 PPB	311.7

NOTES

JOE BYRD, JR.

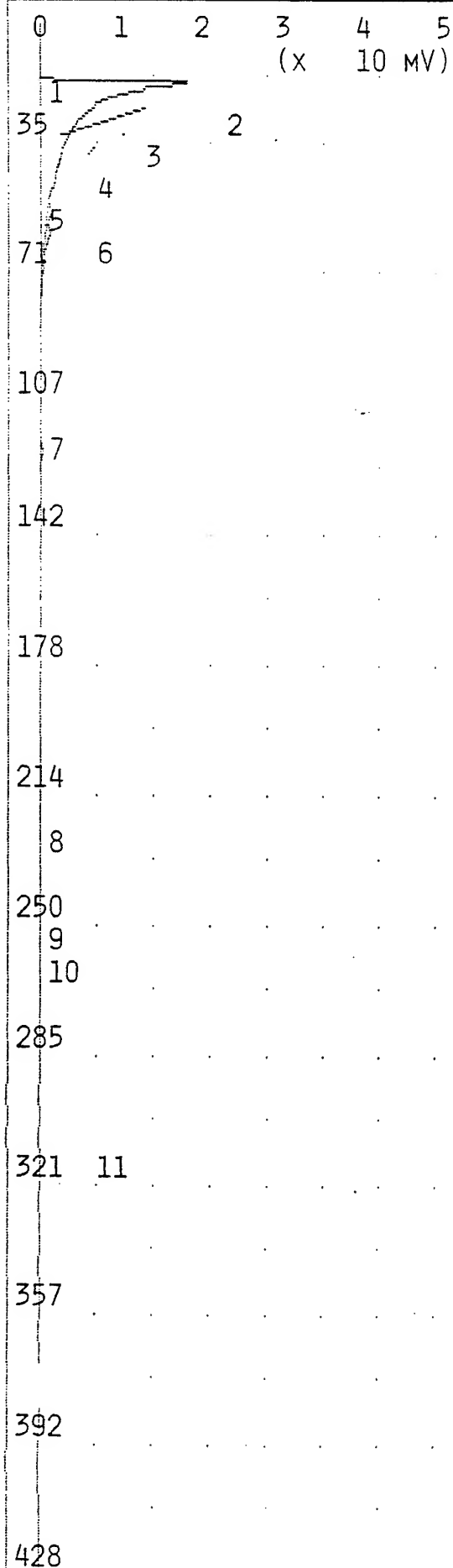
DULUTH ANGB

026-004BH

5.0-7.0 10G

ANALYSIS #7

10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 4,95 13:30

SAMPLE TIME: MAY 4,95 13:22

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 32 C
MAX GAIN 1000
ANALYSIS TIME 500.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.136 MVS	15.1
2	UNKNOWN	187.5 MVS	16.8
3	UNKNOWN	1.429 MVS	18.1
4	UNKNOWN	0.261 MVS	23.6
5	UNKNOWN	1.893 MVS	51.2
6	BENZENE	1.171 PPB	59.0
7	TOLUENE	2.182 PPB	118.0
8	UNKNOWN	2.267 MVS	220.2
9	ETHYLBENZENE	1.928 PPB	246.6
10	M,P-XYLENE	4.476 PPB	261.6
11	O-XYLENE	2.643 PPB	308.2

NOTES

JOE BYRD, JR.

DULUTH ANGB

026-004BH

8.0-10.0 10G

ANALYSIS #8

10S+ GC FUNCTION ANALYSIS REPORT

0 4 8 12 16 20
(x 1000 UV)

TIME PRINTED: MAY 4,95 13:42

SAMPLE TIME: MAY 4,95 13:34

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 32 C
MAX GAIN 1000
ANALYSIS TIME 500.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.094 MVS	14.8
2	UNKNOWN	20.19 MVS	16.7
3	UNKNOWN	133.7 MVS	18.5
4	UNKNOWN	6.334 MVS	51.6
5	BENZENE	6.536 PPB	56.4
6	TOLUENE	1.377 PPB	117.7
7	UNKNOWN	2.237 MVS	156.8
8	UNKNOWN	3.125 MVS	199.0
9	UNKNOWN	7.984 MVS	212.8
10	UNKNOWN	2.627 MVS	239.6
11	UNKNOWN	2.442 MVS	243.7
12	ETHYLBENZENE	3.062 PPB	248.5
13	UNKNOWN	2.040 MVS	253.8
14	M,P-XYLENE	16.95 PPB	261.0
15	UNKNOWN	9.501 MVS	272.2
16	UNKNOWN	2.552 MVS	293.3
17	O-XYLENE	26.25 PPB	311.4
18	UNKNOWN	1.003 MVS	328.5
19	UNKNOWN	0.501 MVS	346.3

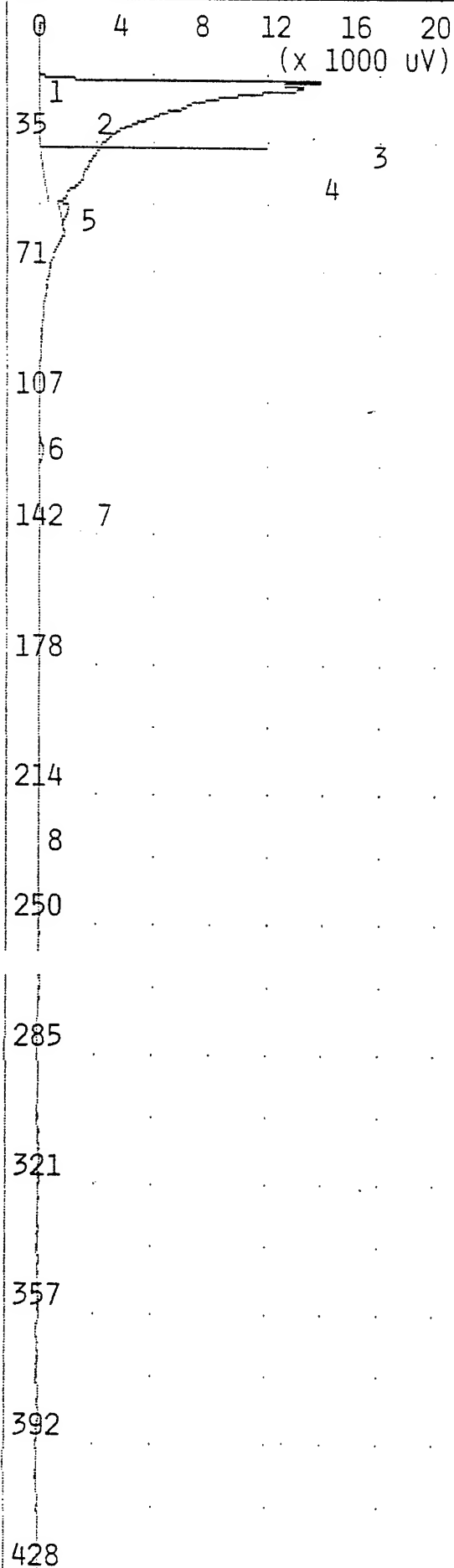
NOTES

JOE BYRD, JR.

DULUTH ANGB

026-001BH

0.5- 2.5 10G



TIME PRINTED: MAY 4,95 13:55

SAMPLE TIME: MAY 4,95 13:46

METHOD

SLOPE UP 1.000 MV/SEC
SLOPE DOWN 3.000 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 32 C
MAX GAIN 1000
ANALYSIS TIME 500.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.073 MVS	13.2
2	UNKNOWN	0.415 MVS	14.8
3	UNKNOWN	18.78 MVS	16.7
4	UNKNOWN	130.6 MVS	18.4
5	UNKNOWN	1.900 MVS	50.8
6	TOLUENE	1.843 PPB	117.4
7	UNKNOWN	0.187 MVS	129.4
8	UNKNOWN	0.915 MVS	217.6

NOTES

JOE BYRD, JR.
DULUTH ANGB
026-001BH
5.0- 7.0 10G

ANALYSIS #10 10S+ GC FUNCTION ANALYSIS REPORT

0 2 4 6 8 10
(x 10 MV)

TIME PRINTED: MAY 4,95 14:06
SAMPLE TIME: MAY 4,95 13:58

METHOD

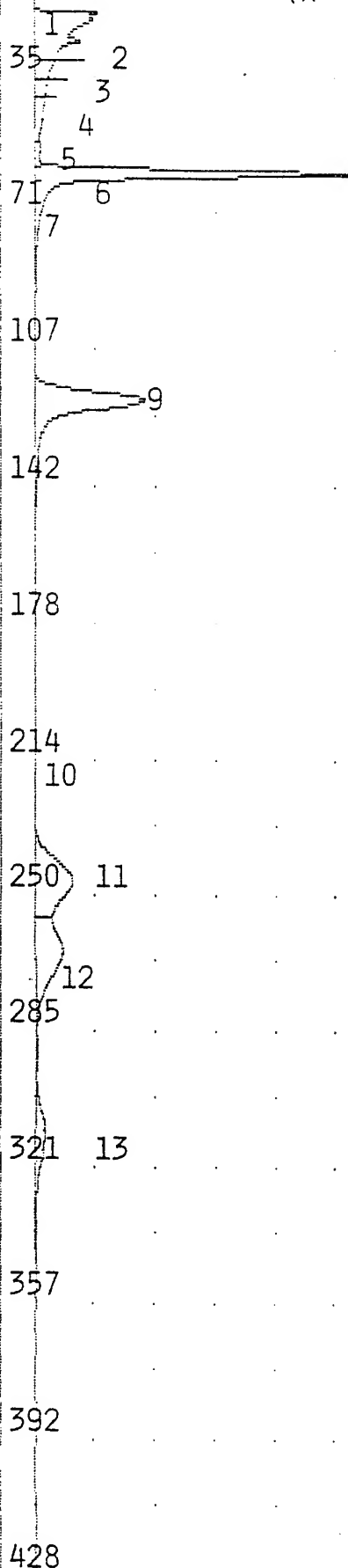
SLOPE UP 1.000 MV/SEC
SLOPE DOWN 3.000 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 32 C
MAX GAIN 1000
ANALYSIS TIME 500.0 SEC

PEAK REPORT

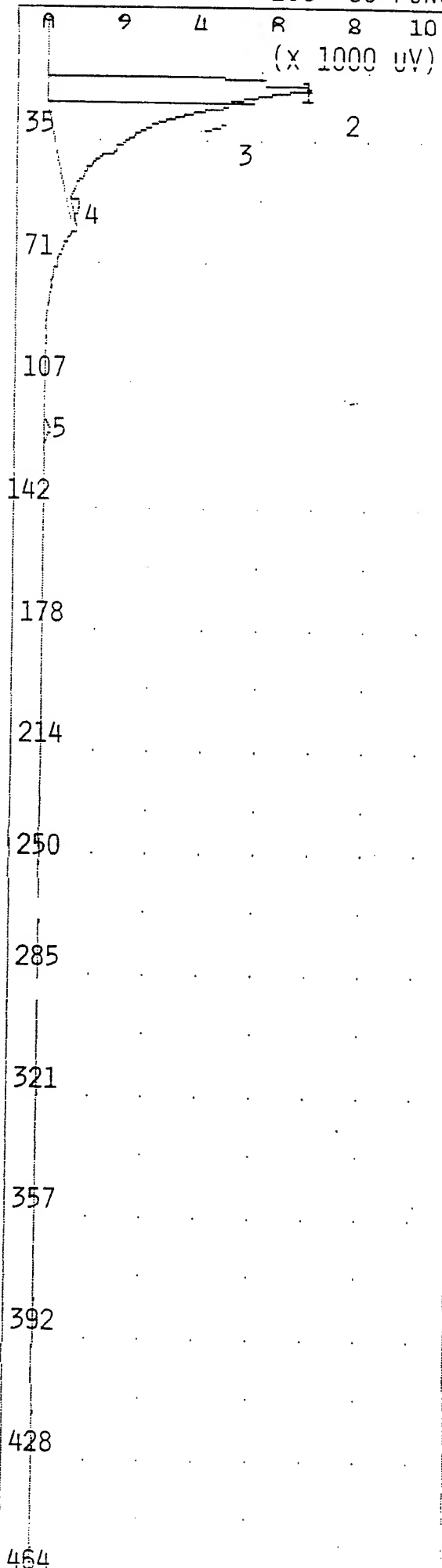
PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.188 MVS	15.1
2	UNKNOWN	20.11 MVS	16.8
3	UNKNOWN	57.93 MVS	18.4
4	UNKNOWN	36.16 MVS	23.9
5	UNKNOWN	63.57 MVS	28.2
6	UNKNOWN	0.929 MVS	51.4
7	UNKNOWN	4.714 MVS	52.2
8	BENZENE	99.98 PPB	58.8
9	TOLUENE	101.7 PPB	117.7
10	UNKNOWN	0.518 MVS	214.0
11	ETHYLBENZENE	101.0 PPB	244.0
12	M,P-XYLENE	210.8 PPB	262.6
13	O-XYLENE	105.0 PPB	310.6

NOTES

JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX



ANALYSIS #11 10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 4,95 14.18
 SAMPLE TIME: MAY 4,95 14:10

METHOD

SLOPE UP 1.000 MV/SEC
 SLOPE DOWN 3.000 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 12 ML/MIN
 B/F FLOW 12 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 32 C
 MAX GAIN 1000
 ANALYSIS TIME 500.0 SEC

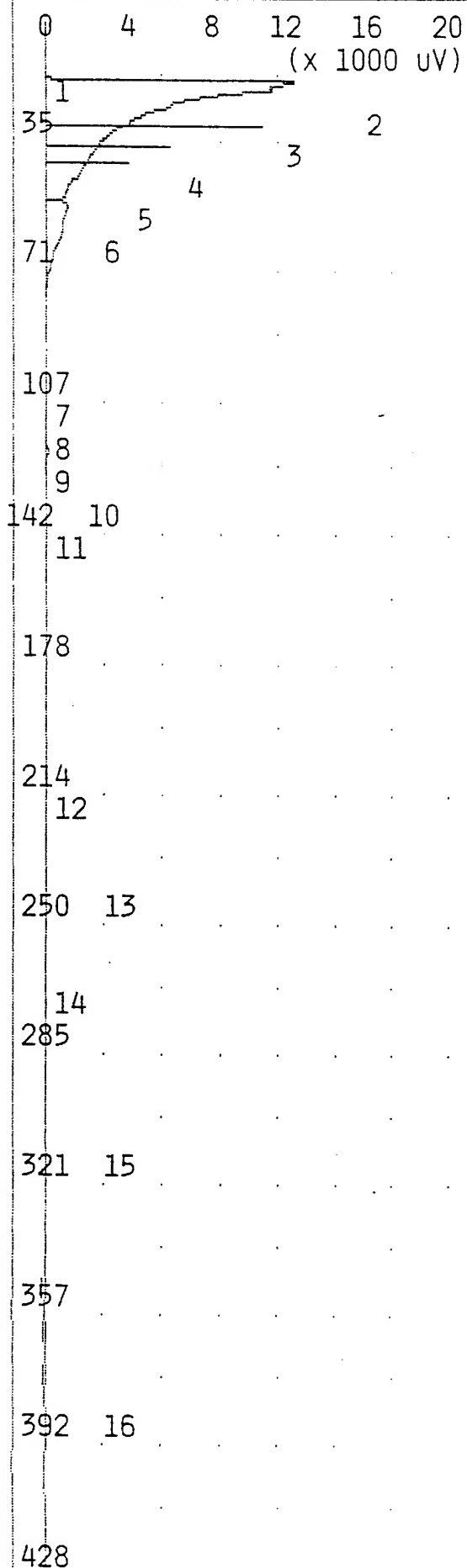
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	7.535 MVS	17.0
2	UNKNOWN	80.74 MVS	18.3
3	UNKNOWN	0.327 MVS	23.7
4	UNKNOWN	0.953 MVS	50.9
5	TOLUENE	1.192 PPB	117.6

NOTES

JOE BYRD, JR.
 DULUTH ANGB
 AIR BLANK

ANALYSIS #12 10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 4,95 14:30
SAMPLE TIME: MAY 4,95 14:22

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 M/SEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 32 C
MAX GAIN 1000

ANALYSIS TIME 500.0 SEC

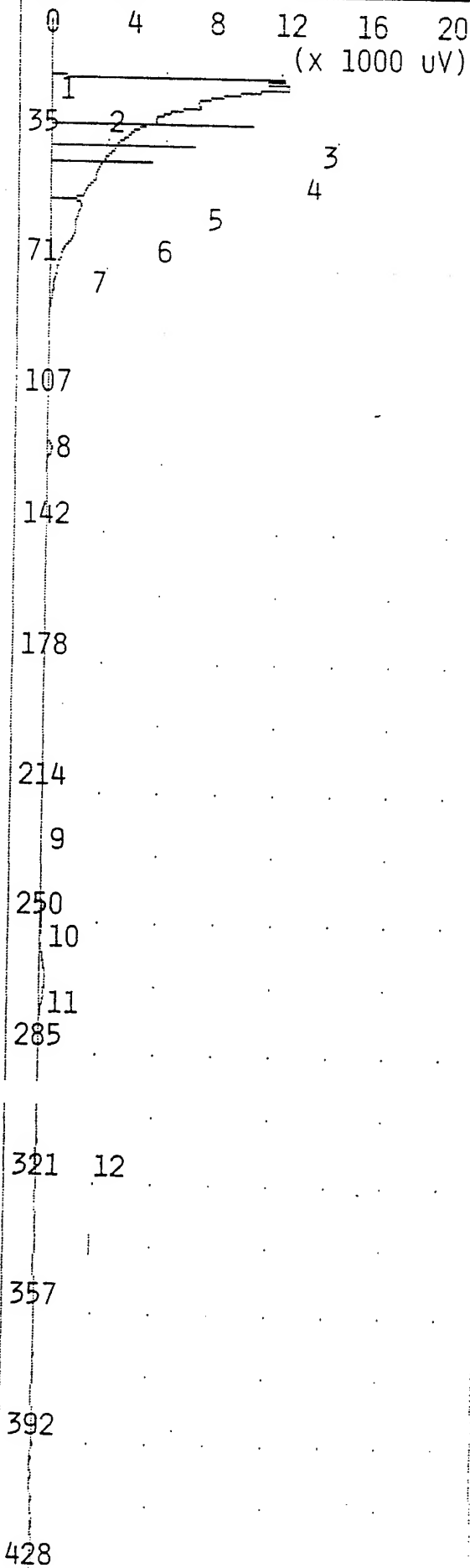
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.234 MVS	15.2
2	UNKNOWN	19.07 MVS	16.8
3	UNKNOWN	48.59 MVS	18.8
4	UNKNOWN	24.11 MVS	23.8
5	UNKNOWN	53.65 MVS	28.2
6	UNKNOWN	19.48 MVS	51.5
7	UNKNOWN	0.081 MVS	109.6
8	TOLUENE	1.932 PPB	118.1
9	UNKNOWN	0.439 MVS	125.8
10	UNKNOWN	0.094 MVS	131.7
11	UNKNOWN	0.041 MVS	135.0
12	UNKNOWN	2.430 MVS	216.4
13	ETHYLBENZENE	1.452 PPB	242.6
14	M,P-XYLENE	14.26 PPB	267.2
15	O-XYLENE	11.15 PPB	311.4
16	UNKNOWN	29.59 MVS	378.6

NOTES

JOE BYRD, JR.
DULUTH ANGB
026-004BH RESHOT
0.5-2.5 10G

ANALYSIS #13 10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 4,95 14:42
SAMPLE TIME: MAY 4,95 14:34

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 32 C
MAX GAIN 1000
ANALYSIS TIME 500.0 SEC

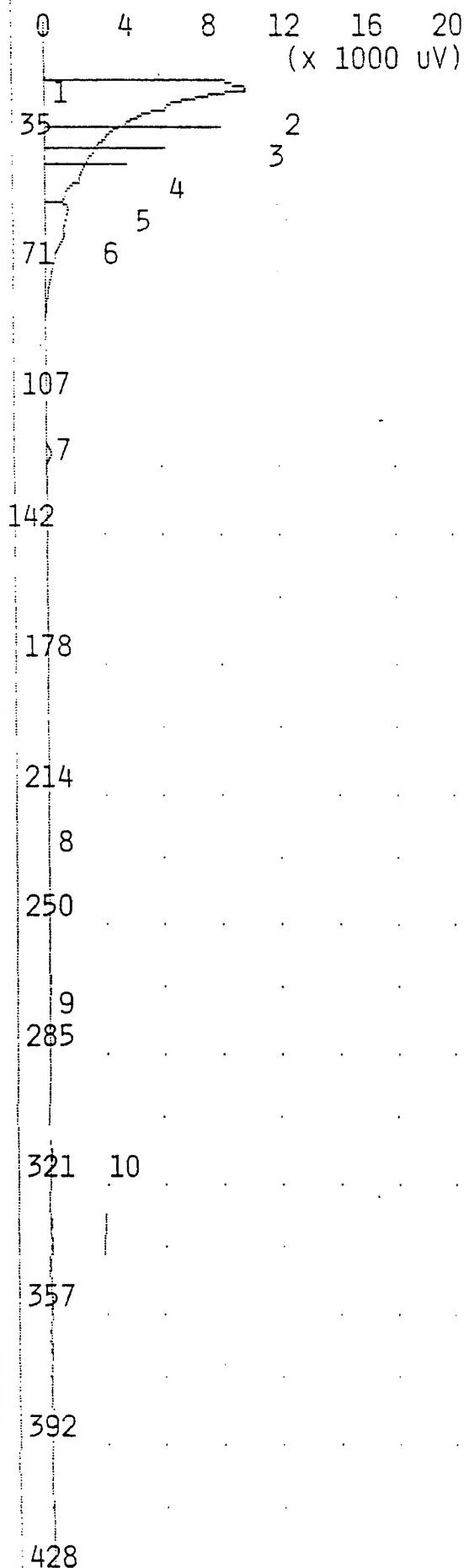
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.085 MVS	12.0
2	UNKNOWN	0.084 MVS	15.2
3	UNKNOWN	16.26 MVS	16.8
4	UNKNOWN	53.37 MVS	18.4
5	UNKNOWN	29.33 MVS	23.8
6	UNKNOWN	68.98 MVS	28.4
7	UNKNOWN	26.22 MVS	51.0
8	TOLUENE	1.859 PPB	118.2
9	UNKNOWN	1.215 MVS	224.0
10	ETHYLBENZENE	2.415 PPB	244.8
11	M,P-XYLENE	10.99 PPB	262.9
12	O-XYLENE	4.920 PPB	309.6

NOTES

JOE BYRD, JR.
DULUTH ANGB
026-001BH
8.0-10.0 10G

ANALYSIS #14 10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 4,95 14:54
 SAMPLE TIME: MAY 4,95 14:46

METHOD

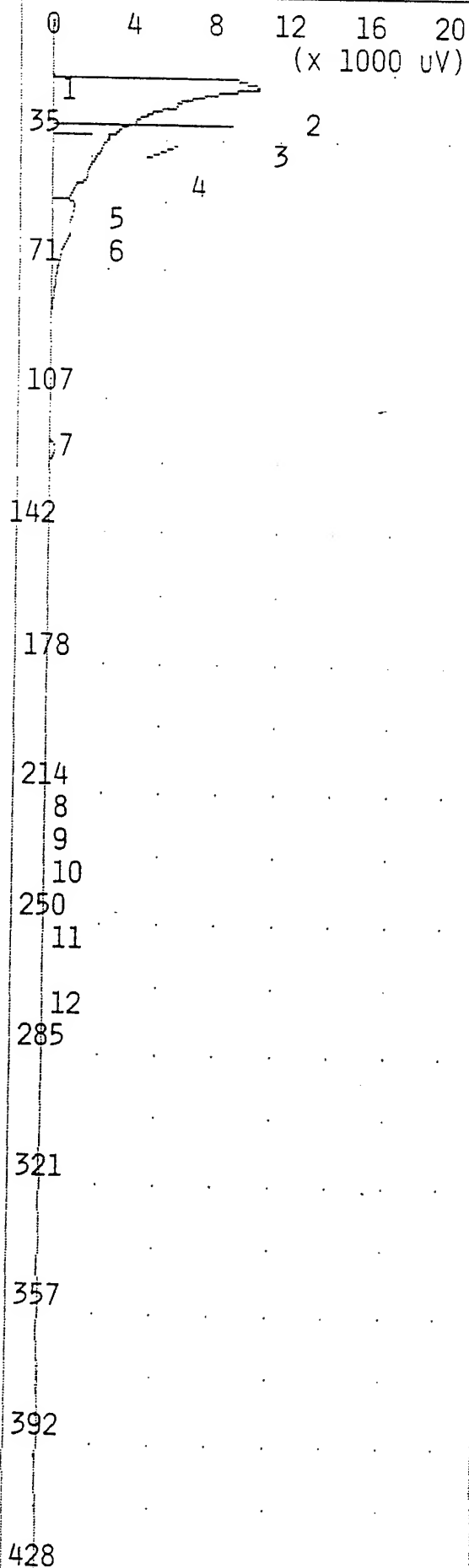
SLOPE UP 0.500 MV/SEC
 SLOPE DOWN 1.500 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 12 ML/MIN
 B/F FLOW 12 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 31 C
 MAX GAIN 1000
 ANALYSIS TIME 500.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.056 MVS	14.8
2	UNKNOWN	13.59 MVS	16.8
3	UNKNOWN	45.94 MVS	18.4
4	UNKNOWN	24.28 MVS	23.6
5	UNKNOWN	50.52 MVS	28.2
6	UNKNOWN	18.28 MVS	51.4
7	TOLUENE	1.567 PPB	118.9
8	UNKNOWN	1.430 MVS	218.6
9	M,P-XYLENE	5.282 PPB	263.2
10	O-XYLENE	2.772 PPB	311.7

NOTES

JOE BYRD, JR.
 DULUTH ANGB
 026-005BH
 1.0- 1.5 10G



TIME PRINTED: MAY 4, 95 15:06

SAMPLE TIME: MAY 4, 95 14:58

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000

ANALYSIS TIME 500.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.055 MVS	15.0
2	UNKNOWN	14.32 MVS	16.8
3	UNKNOWN	86.62 MVS	18.4
4	UNKNOWN	2.331 MVS	23.8
5	UNKNOWN	35.27 MVS	32.4
6	UNKNOWN	17.73 MVS	51.6
7	TOLUENE	1.834 PPB	118.9
8	UNKNOWN	1.032 MVS	215.4
9	UNKNOWN	2.566 MVS	219.6
10	UNKNOWN	3.830 MVS	225.6
11	ETHYLBENZENE	2.298 PPB	247.4
12	M,P-XYLENE	4.692 PPB	265.8

NOTES

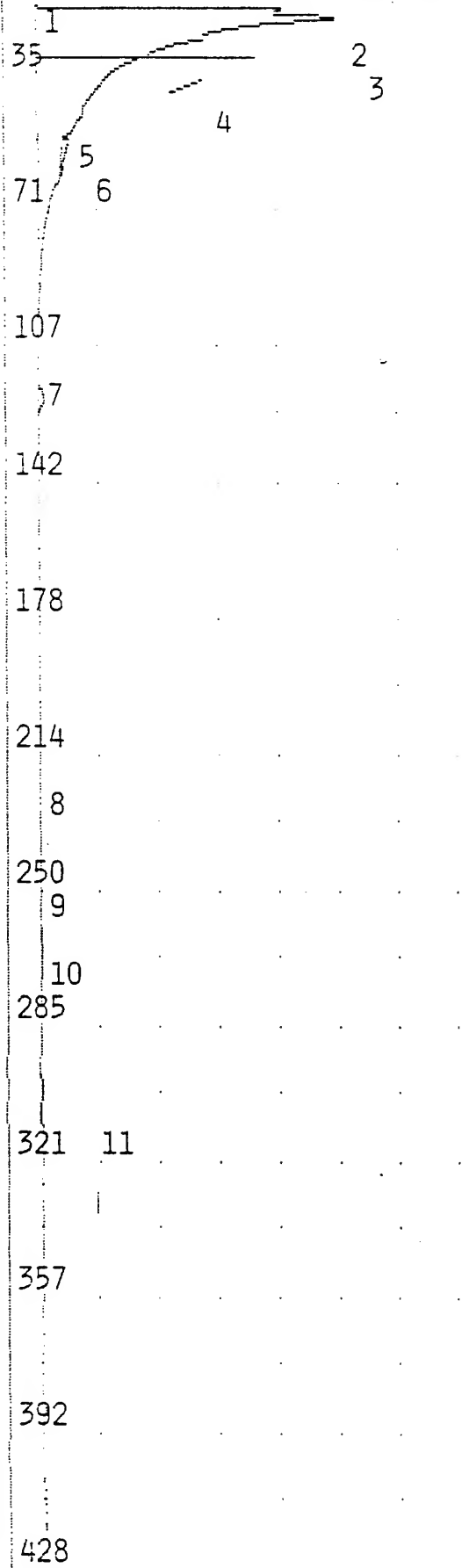
JOE BYRD, JR.

DULUTH ANGB

026-005BH

6.0- 6.5 10G

ANALYSIS #16 10S+ GC FUNCTION ANALYSIS REPORT

0 4 8 12 16 20
(x 1000 UV)

TIME PRINTED: MAY 4,95 15:18

SAMPLE TIME: MAY 4,95 15:10

METHOD

SLOPE UP	0.500	MV/SEC
SLOPE DOWN	1.500	MV/SEC
MIN AREA	0.000	MVSEC
MIN HEIGHT	0.000	MV
ANALYSIS DELAY	0.0	SEC
WINDOW PERCENT	10.0	%
DET FLOW	12	ML/MIN
B/F FLOW	12	ML/MIN
AUX FLOW	0	ML/MIN
OVEN TEMP	40	C
AMB TEMP	31	C
MAX GAIN	1000	
ANALYSIS TIME	500.0	SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.071 MVS	14.9
2	UNKNOWN	16.64 MVS	16.8
3	UNKNOWN	184.9 MVS	18.4
4	UNKNOWN	0.728 MVS	23.8
5	UNKNOWN	1.182 MVS	51.0
6	BENZENE	0.063 PPB	58.6
7	TOLUENE	1.379 PPB	118.4
8	UNKNOWN	0.892 MVS	219.6
9	ETHYLBENZENE	0.282 PPB	248.2
10	M,P-XYLENE	2.216 PPB	265.8
11	O-XYLENE	1.157 PPB	307.4

NOTES

JOE BYRD, JR.
DULUTH ANGB
026-005BH
10.0 10G

0 2 4 6 8 10
(x 10 MV)

TIME PRINTED: MAY 4,95 15:30

SAMPLE TIME: MAY 4,95 15:22

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000
ANALYSIS TIME 500.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.118 MVS	12.8
2	UNKNOWN	0.121 MVS	15.2
3	UNKNOWN	14.51 MVS	16.8
4	UNKNOWN	46.10 MVS	18.4
5	UNKNOWN	29.96 MVS	24.0
6	UNKNOWN	47.06 MVS	28.5
7	UNKNOWN	11.54 MVS	43.5
8	UNKNOWN	6.932 MVS	51.2
9	BENZENE	92.64 PPB	59.2
10	TOLUENE	88.84 PPB	118.5
11	UNKNOWN	1.017 MVS	222.2
12	ETHYLBENZENE	83.08 PPB	245.0
13	M,P-XYLENE	171.0 PPB	264.2
14	O-XYLENE	94.51 PPB	311.4

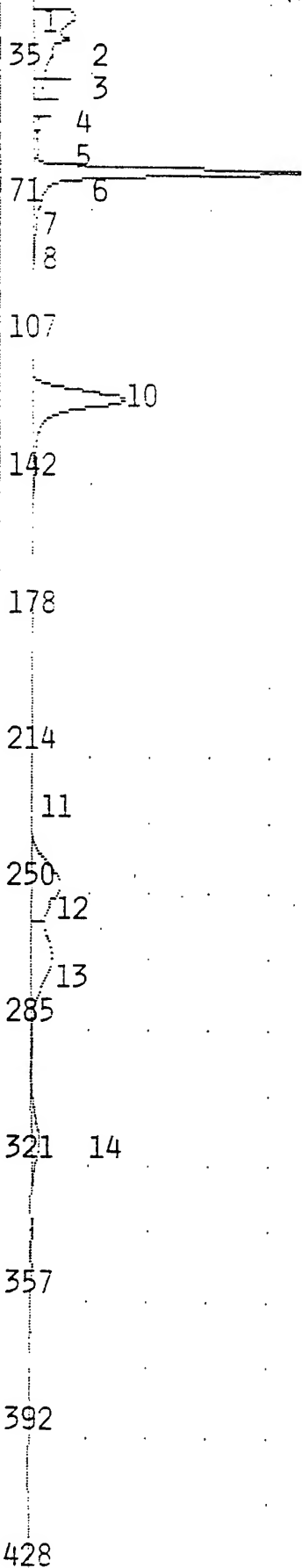
NOTES

JOE BYRD, JR.
DULUTH ANGB

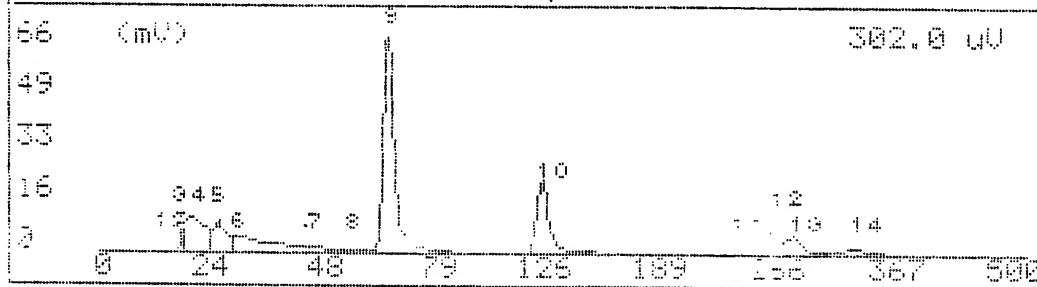
~~026-005BH~~

~~10.0~~ ~~10c~~
100 ppb BTEX

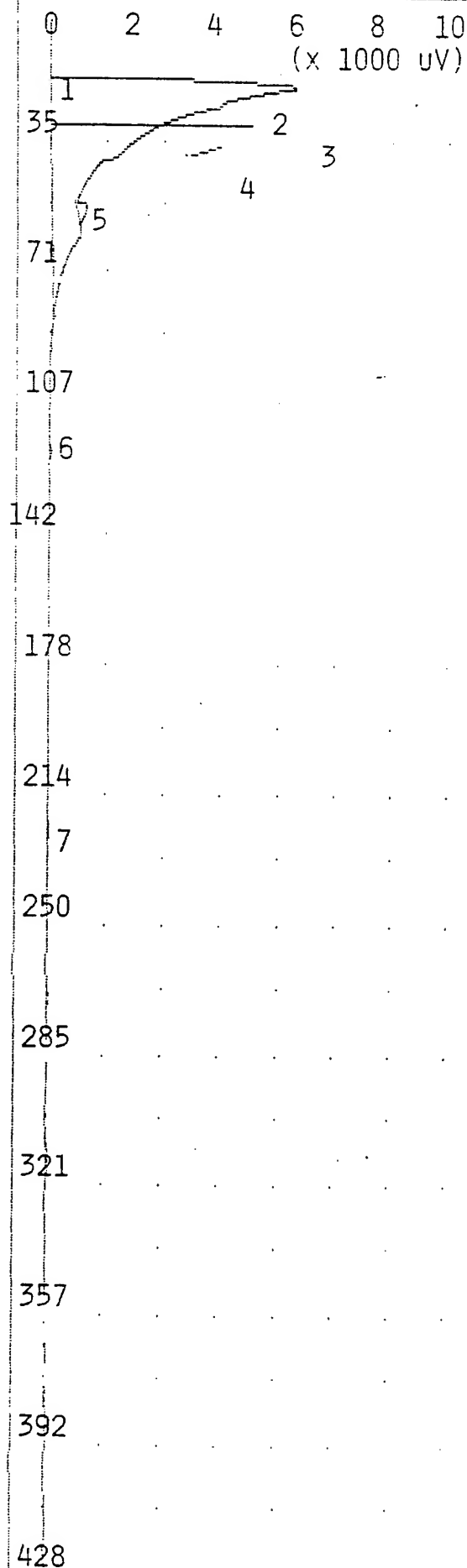
JB



S.C. Ready 18: GC Function Ver. 5.95 15:36
 -- Analysis No 17 -- Run at -- Mar 1.95 15:32 --
 Pk No Name Conc/Area Y-Axis Ret. Time
 6 Unknown 47.06 mUS -No- 20.00 sec
 7 Unknown 11.34 mUS -No- 40.00 sec
 8 Unknown 6.93 mUS -No- 51.00 sec
 9 benzene 100.00 ppb -No- 60.00 sec
 10 toluene 100.00 ppb -No- 110.00 sec
 11 Unknown 1.01 mUS -No- 220.00 sec
 12 ethylbenzene 99.99 ppb -No- 240.00 sec
 13 m,p-xylene 200.00 ppb -No- 264.20 sec
 14 o-xylene 99.99 ppb -No- 311.40 sec
 - Detected 14 peaks. Use +, - to scroll 505 sec



ANALYSIS #18 10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 4,95 15:53
SAMPLE TIME: MAY 4,95 15:38

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000
ANALYSIS TIME 500.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.090 MVS	14.6
2	UNKNOWN	6.144 MVS	16.9
3	UNKNOWN	97.76 MVS	18.4
4	UNKNOWN	0.285 MVS	23.5
5	UNKNOWN	1.108 MVS	51.5
6	TOLUENE	0.653 PPB	118.5
7	ETHYLBENZENE	1.473 PPB	220.8

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK

ANALYSIS #10 10S+ GC FUNCTION ANALYSIS REPORT

A 4 8 19 1R 9R
(X 1000 UV)
(X 1000 UV)

TIME PRINTER: MAY 4, 95 15:56

SAMPLE TIME: MAY 4, 95 15:56

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000

ANALYSIS TIME 500.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.076 MVS	15.2
2	UNKNOWN	19.72 MVS	16.9
3	UNKNOWN	80.69 MVS	18.4
4	UNKNOWN	66.59 MVS	28.5
5	UNKNOWN	11.56 MVS	51.4
6	BENZENE	7.335 PPB	59.2
7	TOLUENE	1.900 PPB	118.9
8	UNKNOWN	2.853 MVS	219.6
9	ETHYLBENZENE	1.824 PPB	246.4
10	M,P-XYLENE	3.847 PPB	265.3
11	UNKNOWN	0.309 MVS	273.0
12	O-XYLENE	3.561 PPB	307.4

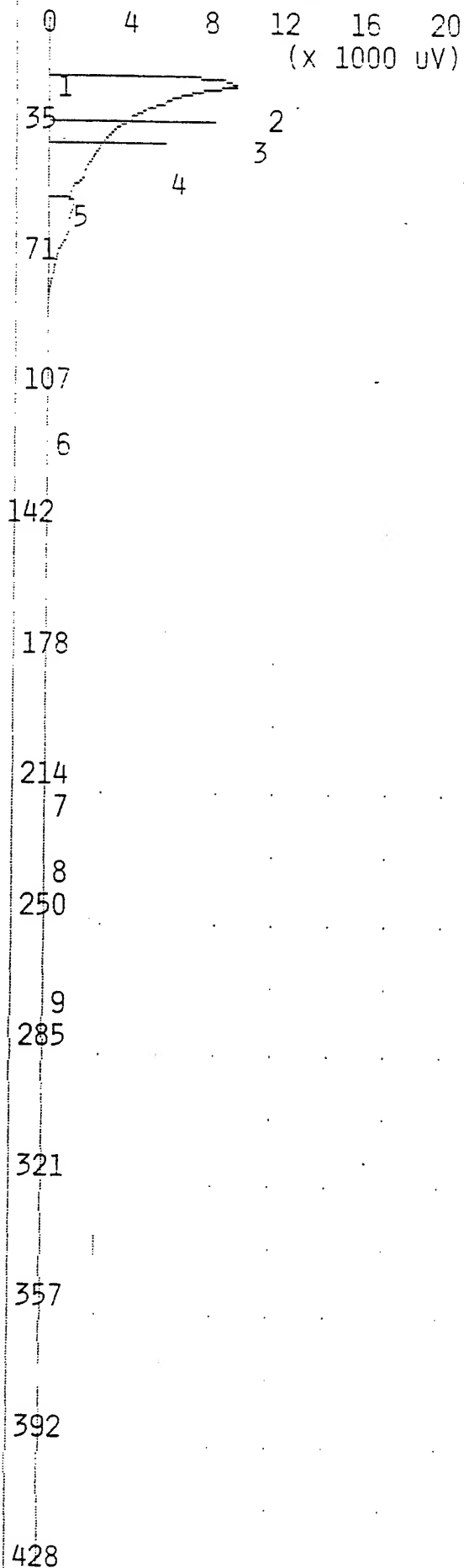
NOTES

JOE BYRD, JR.
DULUTH ANG
026-006BH

0.5- 2.5 10G

ANALYSIS #20

10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 4,95 16:23
SAMPLE TIME: MAY 4,95 16:15

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000

ANALYSIS TIME 500.0 SEC

PEAK REPORT

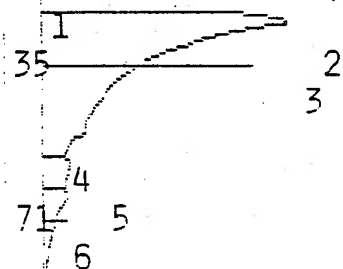
PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.044 MVS	14.7
2	UNKNOWN	12.28 MVS	16.9
3	UNKNOWN	45.55 MVS	18.7
4	UNKNOWN	79.58 MVS	23.8
5	UNKNOWN	23.34 MVS	51.2
6	TOLUENE	1.173 PPB	118.8
7	UNKNOWN	0.500 MVS	217.0
8	ETHYLBENZENE	0.263 PPB	227.0
9	M,P-XYLENE	2.936 PPB	265.3

NOTES

JOE BYRD, JR.
DULUTH ANG3
026-006BH

0.5- 2.5 10G

ANALYSIS #21 10S+ GC FUNCTION ANALYSIS REPORT

0 4 8 12 16 20
(x 1000 UV)

107

7

142

8

9

178

214

10

250 11

12

285

321 13

357

392

428

TIME PRINTED: MAY 4,95 16:35
SAMPLE TIME: MAY 4,95 16:27

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000
ANALYSIS TIME 500.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.011 MVS	14.8
2	UNKNOWN	13.43 MVS	16.8
3	UNKNOWN	130.2 MVS	18.4
4	UNKNOWN	8.796 MVS	51.4
5	UNKNOWN	1.760 MVS	58.6
6	BENZENE	5.456 PPB	59.3
7	TOLUENE	2.228 PPB	118.2
8	UNKNOWN	2.715 MVS	140.6
9	UNKNOWN	3.136 MVS	160.8
10	UNKNOWN	1.860 MVS	213.6
11	ETHYLBENZENE	0.483 PPB	244.0
12	M,P-XYLENE	3.539 PPB	266.1
13	O-XYLENE	1.761 PPB	312.0

NOTES

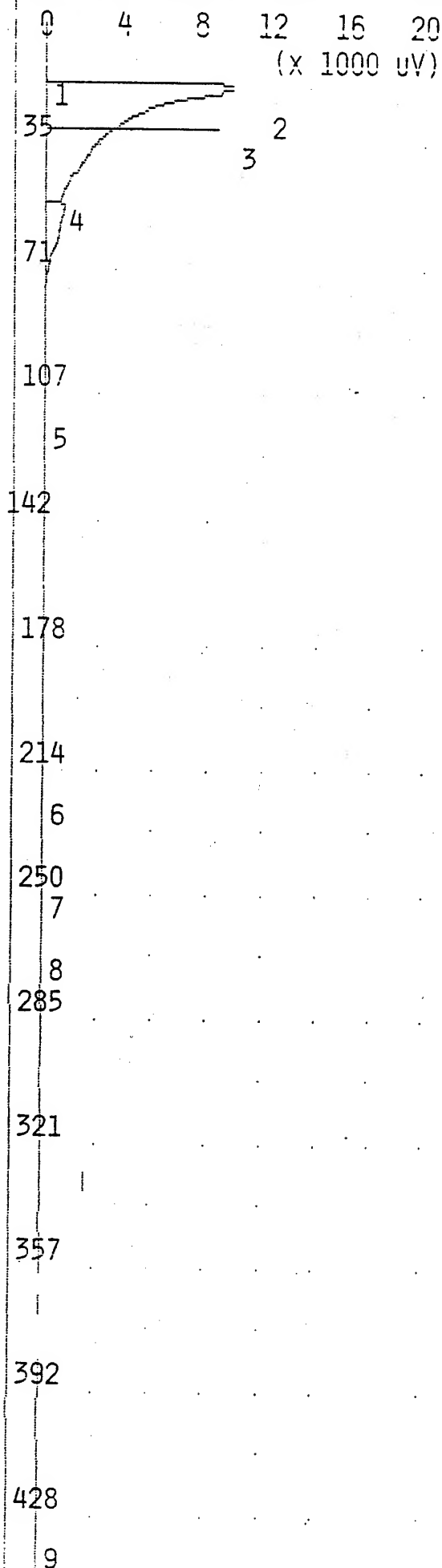
JOE BYRD, JR.

DULUTH ANGB

026-006BH

11.0-11.5 106

ANALYSIS #22 10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 4,95 16:47
SAMPLE TIME: MAY 4,95 16:39

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000
ANALYSIS TIME 500.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.059 MVS	14.8
2	UNKNOWN	15.59 MVS	16.8
3	UNKNOWN	112.8 MVS	18.3
4	UNKNOWN	16.84 MVS	50.7
5	TOLUENE	1.598 PPB	119.0
6	UNKNOWN	1.160 MVS	220.0
7	ETHYLBENZENE	0.860 PPB	249.3
8	M,P-XYLENE	2.493 PPB	264.0
9	UNKNOWN	0.077 MVS	433.6

NOTES

JOE BYRD, JR.
DULUTH ANGB
026-002BH
0.5- 2.5 10G

ANALYSIS #23 10S+ GC FUNCTION ANALYSIS REPORT

0 4 8- 179 188 109

SLOPE UP 1.000 MV/SEC

SLOPE DOWN 3.000 MV/SEC

MIN AREA 0.000 MVSEC

MIN HEIGHT 0.000 MV

ANALYSIS DELAY 0.0 SEC

WINDOW PERCENT 10.0 %

DET FLOW 12 ML/MIN

B/F FLOW 12 ML/MIN

AUX FLOW 0 ML/MIN

OVEN TEMP 40 C

AMB TEMP 31 C

MAX GAIN 1000

ANALYSIS TIME 500.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	12.77 MVS	16.8
2	UNKNOWN	101.2 MVS	18.8
3	UNKNOWN	2.405 MVS	51.2
4	TOLUENE	1.414 PPB	119.0
5	UNKNOWN	1.087 MVS	219.0

NOTES

JOE BYRD, JR.

DULUTH ANG3

026-002BH

5.0- 7.5 10g

ANALYSIS #24 10S+ GC FUNCTION ANALYSIS REPORT

TIME PRINTED: MAY 4 '85 17:12

SAMPLE TIME: MAY 1985 17:12

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000
ANALYSIS TIME 500.0 SEC

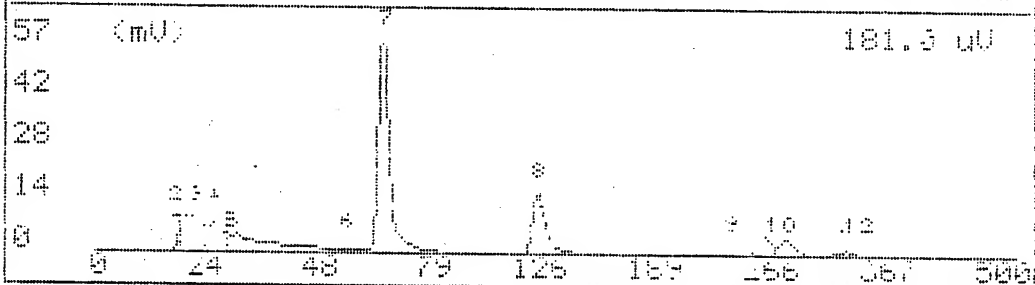
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.071 MVS	14.8
2	UNKNOWN	11.67 MVS	16.8
3	UNKNOWN	44.68 MVS	18.5
4	UNKNOWN	29.68 MVS	24.1
5	UNKNOWN	55.88 MVS	28.6
6	UNKNOWN	7.417 MVS	50.9
7	BENZENE	89.53 PPB	59.3
8	TOLUENE	80.78 PPB	118.5
9	UNKNOWN	0.824 MVS	220.2
10	ETHYLBENZENE	80.83 PPB	245.3
11	M,P-XYLENE	158.9 PPB	264.2
12	O-XYLENE	72.85 PPB	312.5

NOTES

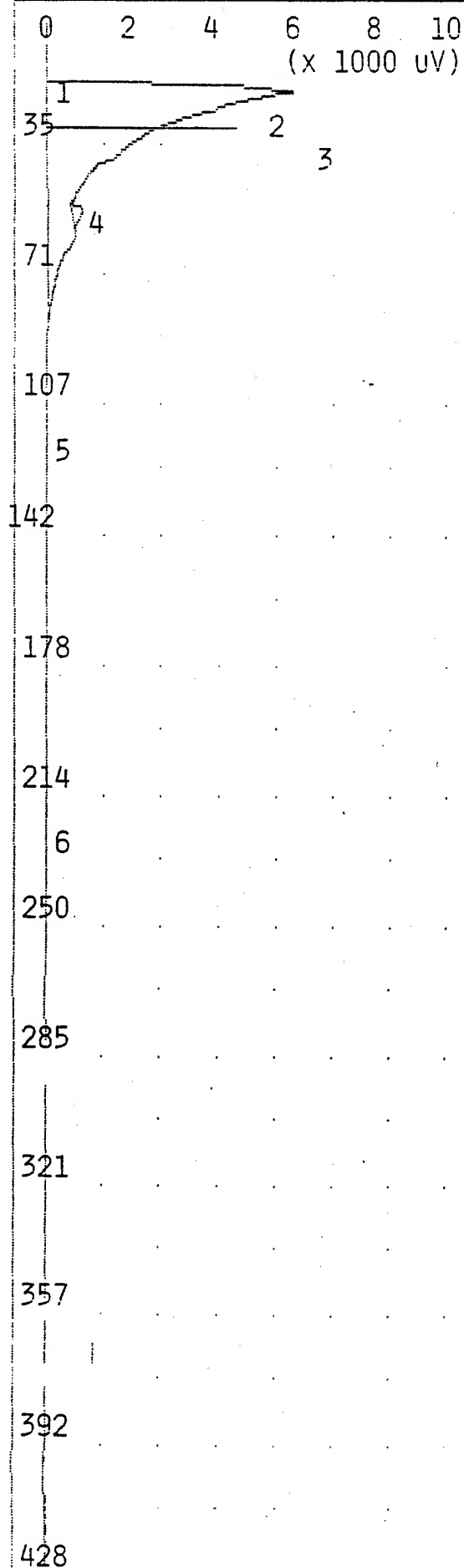
JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX

A.C. ready 100+ 60 Function: Rel. +.35 17					
Analysis No 24 -- Run at -- 17.11					
Pk	Name	Conc	Area	Height	Ret. time
1	Unknown	25.60	mUS	100	24.1 sec
2	Unknown	35.80	mUS	100	35.8 sec
3	Unknown	7.41	mUS	100	37.4 sec
4	benzene	95.90	PPB	100	50.9 sec
5	toluene	100.0	PPB	100	110.0 sec
6	Unknown	0.82	mUS	100	200.0 sec
7	ethyl benzene	100.0	PPB	100	224.0 sec
8	m,p-xylene	200.0	PPB	100	264.0 sec
9	o-xylene	100.0	PPB	100	310.0 sec
- Detected 12 peaks. Use + + to scroll: [500 sec]					



ANALYSIS #25

10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 4,95 17:27

SAMPLE TIME: MAY 4,95 17:19

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000

ANALYSIS TIME 500.0 SEC

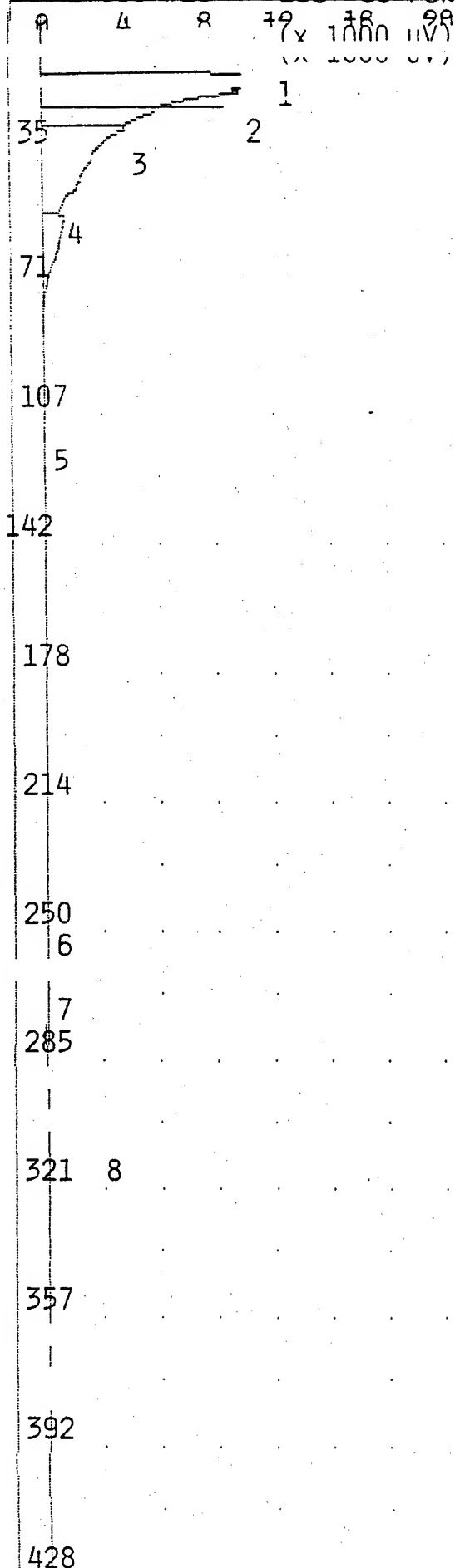
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.030 MVS	15.0
2	UNKNOWN	6.022 MVS	17.0
3	UNKNOWN	99.35 MVS	18.6
4	UNKNOWN	1.079 MVS	51.2
5	TOLUENE	0.353 PPB	118.5
6	ETHYLBENZENE	0.537 PPB	220.8

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK

ANALYSIS #26 10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTER: MAY 4 05 17:39
 SAMPLE TIME: MAY 4 05 17:31
 SAMPLE TIME: MAY 4 05 17:31

METHOD

SLOPE UP 0.500 MV/SEC
 SLOPE DOWN 1.500 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 12 ML/MIN
 B/F FLOW 12 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 31 C
 MAX GAIN 1000
 ANALYSIS TIME 500.0 SEC

PEAK REPORT

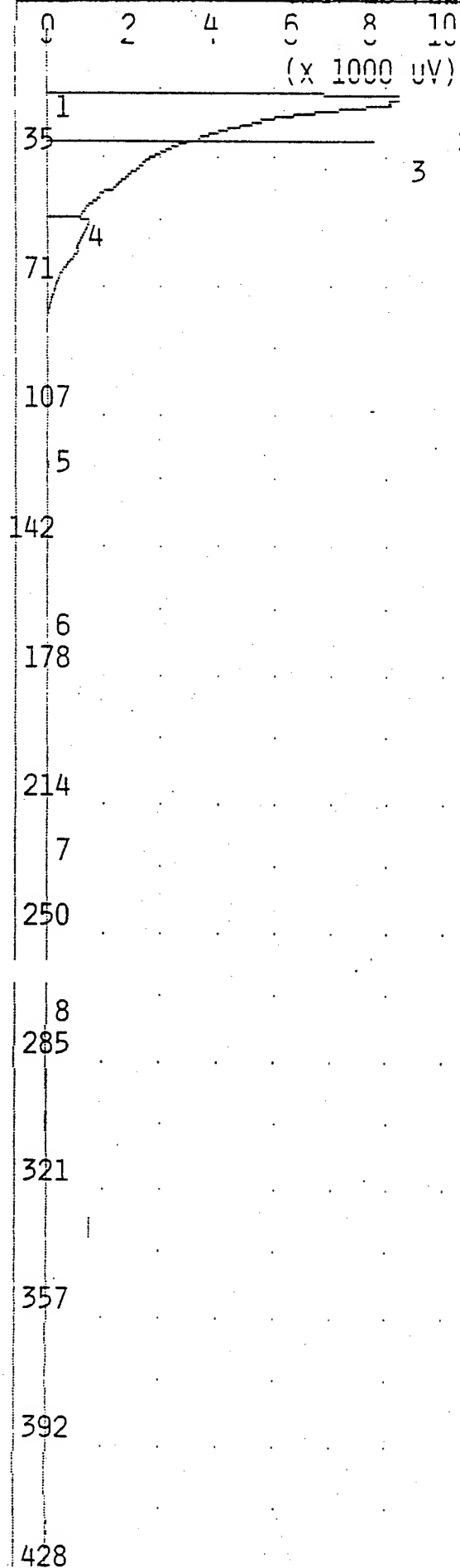
PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	15.15 MVS	16.9
2	UNKNOWN	67.29 MVS	19.0
3	UNKNOWN	52.60 MVS	28.6
4	UNKNOWN	19.23 MVS	51.0
5	TOLUENE	1.779 PPB	118.2
6	ETHYLBENZENE	0.834 PPB	245.0
7	M,P-XYLENE	7.643 PPB	263.4
8	O-XYLENE	2.089 PPB	314.4

NOTES

JOE BYRD, JR.
 DULUTH ANGB
~~AIR BLANK~~
 026-003 BH
 0.5'-2.5'

10g

ANALYSIS #27 10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 4 95 17:51

TIME PRINTED: MAY 4 95 17:51

SAMPLE TIME: MAY 4,95 17:43

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000
ANALYSIS TIME 500.0 SEC

PEAK REPORT

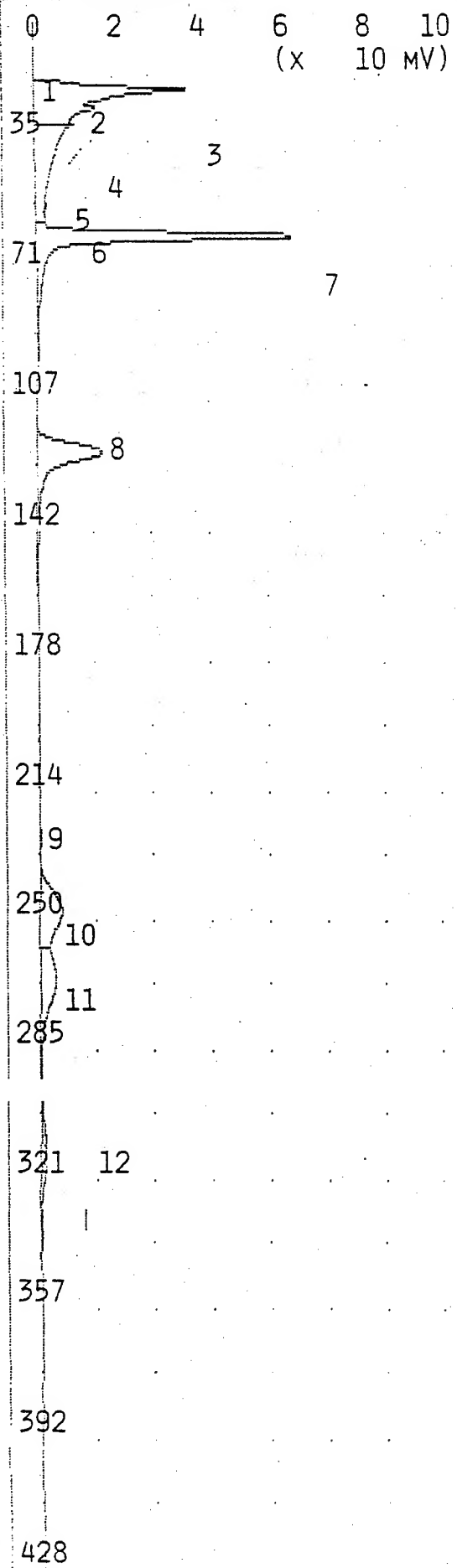
PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.034 MVS	14.7
2	UNKNOWN	12.82 MVS	16.9
3	UNKNOWN	110.8 MVS	18.6
4	UNKNOWN	18.07 MVS	51.2
5	TOLUENE	1.596 PPB	118.4
6	UNKNOWN	0.583 MVS	157.0
7	UNKNOWN	0.432 MVS	218.0
8	M,P-XYLENE	3.998 PPB	266.4

NOTES

JOE BYRD, JR.
DULUTH ANGB
026-003BH
5.0-7.0

10G

ANALYSIS #28 10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 4,95 18:04
 SAMPLE TIME: MAY 4,95 17:56

METHOD

SLOPE UP 1.000 MV/SEC
 SLOPE DOWN 3.000 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 12 ML/MIN
 B/F FLOW 12 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 31 C
 MAX GAIN 1000
 ANALYSIS TIME 500.0 SEC

PEAK REPORT

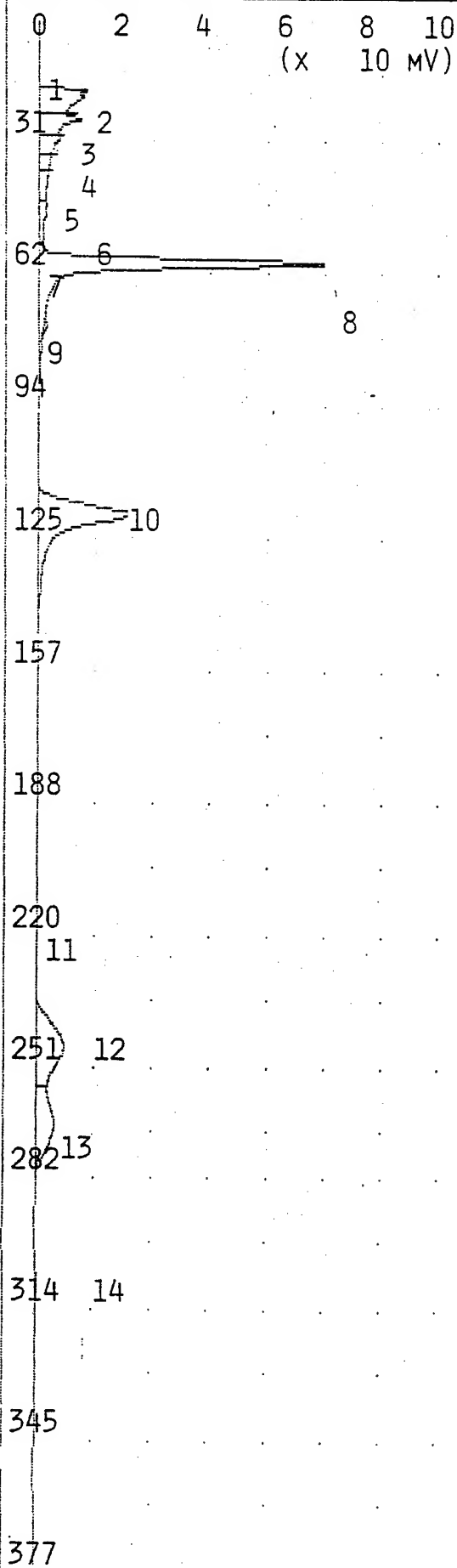
PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.203 MVS	13.5
2	UNKNOWN	13.51 MVS	17.0
3	UNKNOWN	302.0 MVS	18.7
4	UNKNOWN	6.501 MVS	24.3
5	UNKNOWN	1.111 MVS	28.8
6	UNKNOWN	0.778 MVS	51.1
7	BENZENE	108.6 PPB	59.4
8	TOLUENE	96.42 PPB	118.5
9	UNKNOWN	1.804 MVS	218.8
10	ETHYLBENZENE	95.01 PPB	245.3
11	M,P-XYLENE	180.8 PPB	263.4
12	O-XYLENE	87.87 PPB	311.2

NOTES

DESTROY GREENWAY
 DULUTH ANGB
 100 PPB BTEX

ANALYSIS #2

10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 5,95 12:09

SAMPLE TIME: MAY 5,95 12:01

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 29 C
MAX GAIN 1000
ANALYSIS TIME 440.0 SEC

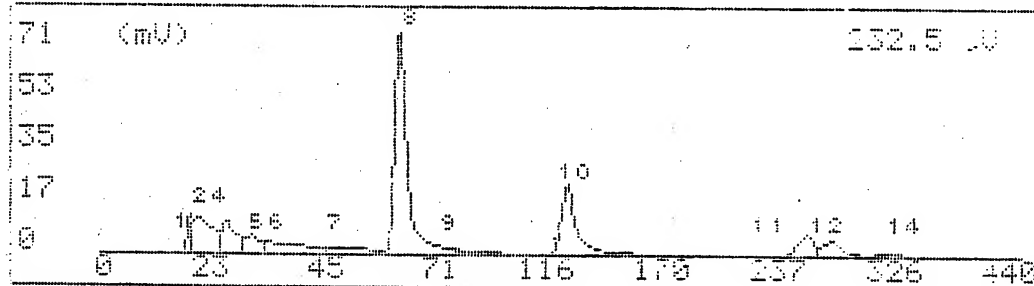
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.050 MVS	15.5
2	UNKNOWN	15.29 MVS	17.0
3	UNKNOWN	46.72 MVS	18.5
4	UNKNOWN	34.06 MVS	24.2
5	UNKNOWN	19.27 MVS	28.8
6	UNKNOWN	31.97 MVS	32.2
7	UNKNOWN	18.06 MVS	44.5
8	BENZENE	108.0 PPB	58.4
9	UNKNOWN	1.828 MVS	73.2
10	TOLUENE	89.07 PPB	117.8
11	UNKNOWN	1.712 MVS	218.2
12	ETHYLBENZENE	83.53 PPB	244.0
13	UNKNOWN	72.21 MVS	262.9
14	O-XYLENE	72.36 PPB	308.5

NOTES

JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX

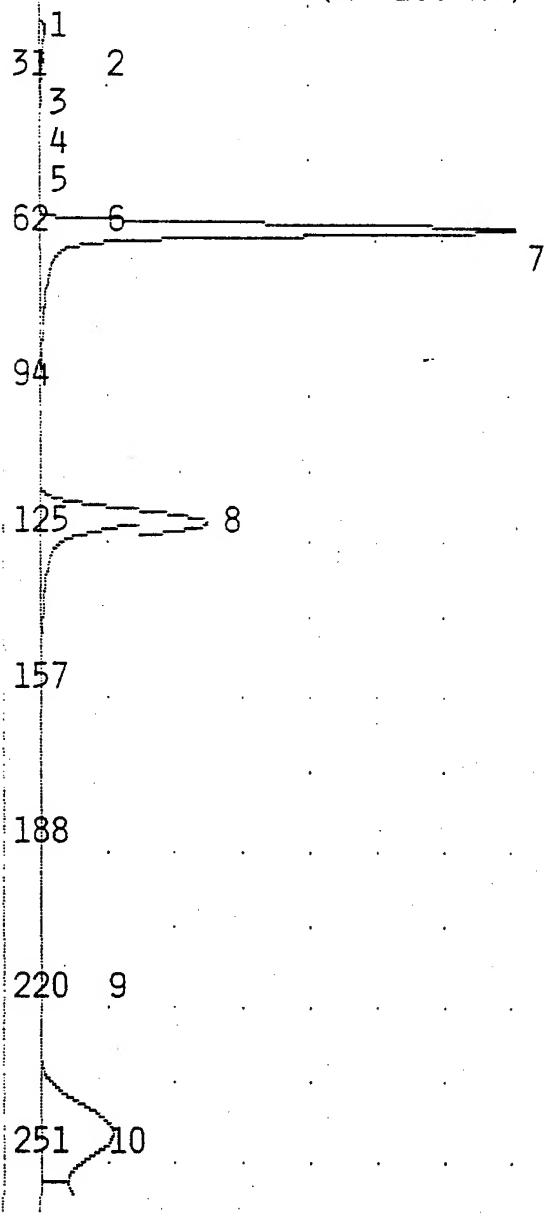
S.C. Ready		108+ GC Function		Ms	5.95	1.18
-- Analysis No 2		-- Run at		Ms	5.95	12:00
Pk No	Name	Conc/Area	Alert	Ret. Time		
6	Unknown	31.97 m/g	-N-	32.2	sec	
7	Unknown	18.06 m/g	-N-	34.0	sec	
8	benzene	100.0 p.p.m	-N-	30.3	sec	
9	Unknown	1.828 m/g	-N-	36.2	sec	
10	toluene	100.0 p.p.m	-N-	37.7	sec	
11	Unknown	1.712 m/g	-N-	41.8	sec	
12	ethylbenzene	100.0 p.p.m	-N-	44.0	sec	
13	m,p-xylene	200.0 p.p.m	-N-	52.0	sec	
14	o-xylene	100.0 p.p.m	-N-	53.5	sec	
- Detected 14 peaks. Use + + to scroll. [445 sec]						



ANALYSIS #3

10S+ GC FUNCTION ANALYSIS REPORT

0 2 4 6 8 10
(x 100 mV)



TIME PRINTED: MAY 5,95 12:29

SAMPLE TIME: MAY 5,95 12:22

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 30 C
MAX GAIN 1000
ANALYSIS TIME 440.0 SEC

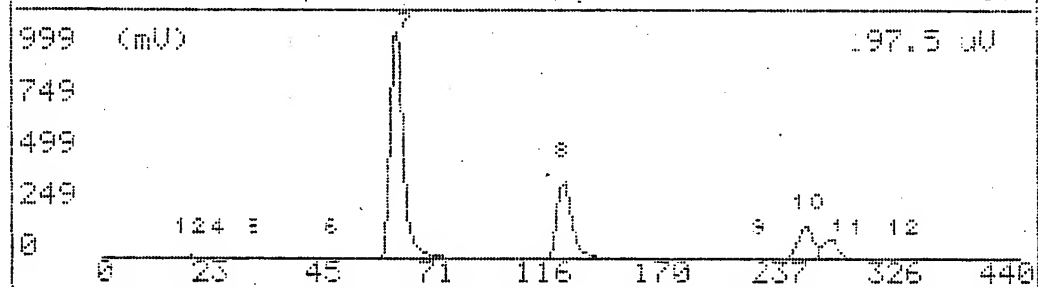
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.035 MVS	15.0
2	UNKNOWN	18.43 MVS	17.0
3	UNKNOWN	56.33 MVS	18.6
4	UNKNOWN	37.44 MVS	24.2
5	UNKNOWN	53.75 MVS	28.6
6	UNKNOWN	16.94 MVS	44.6
7	BENZENE	1.472 PPM	58.6
8	TOLUENE	1.635 PPM	117.3
9	UNKNOWN	0.590 MVS	211.0
10	ETHYLBENZENE	2.139 PPM	243.2
11	M,P-XYLENE	3.952 PPM	261.6
12	O-XYLENE	2.758 PPM	307.4

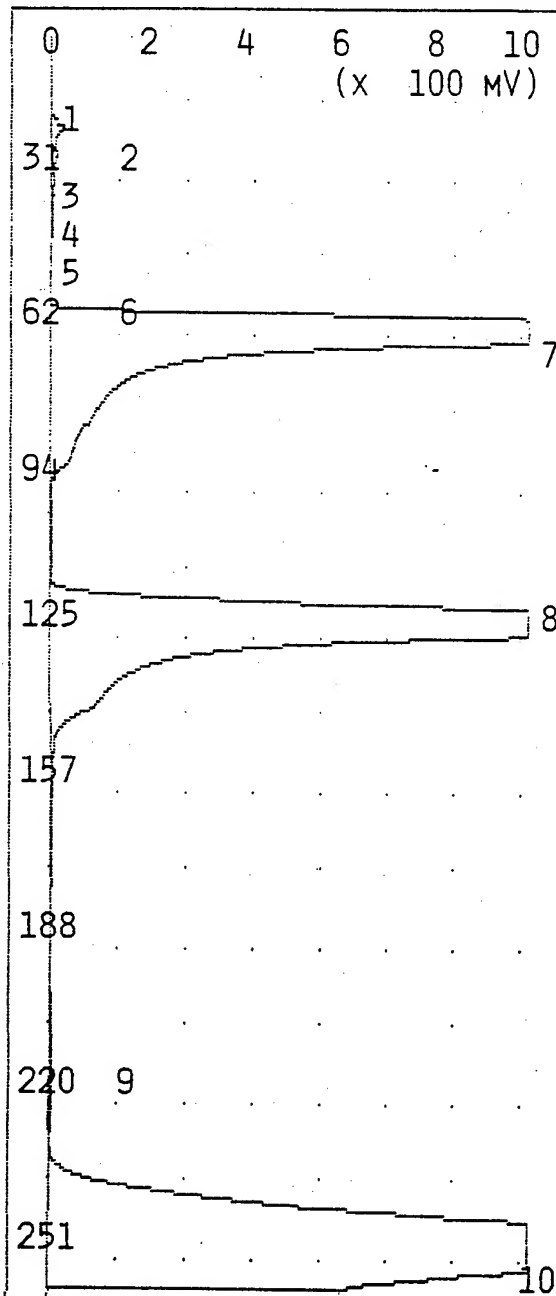
NOTES

JOE BYRD, JR.
DULUTH ANGB
1 PPM BTEX

S.C. Reedy 10S+ GC Function May 5, 95 12:13				
-- Analysis: No 0 -- Run at -- May 5, 95 12:13				
Pk no	Name	Conc/Area	Alarm	Ret. Time
4	Unknown	37.44 mUS	-No-	24.0 sec
5	Unknown	53.75 mUS	-No-	28.0 sec
6	Unknown	16.94 mUS	-No-	44.0 sec
7	benzene	1.000 ppm	-No-	50.0 sec
8	toluene	1.000 ppm	-No-	117.0 sec
9	Unknown	0.590 mUS	-No-	211.0 sec
10	ethylbenzene	1.000 ppm	-No-	243.0 sec
11	m,p-xylene	1.000 ppm	-No-	261.0 sec
12	o-xylene	1.000 ppm	-No-	307.0 sec
- Detected 12 peaks. Use + + to scroll. [445 sec]				



ANALYSIS #4 10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 5,95 12:45
SAMPLE TIME: MAY 5,95 12:38

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000
ANALYSIS TIME 440.0 SEC

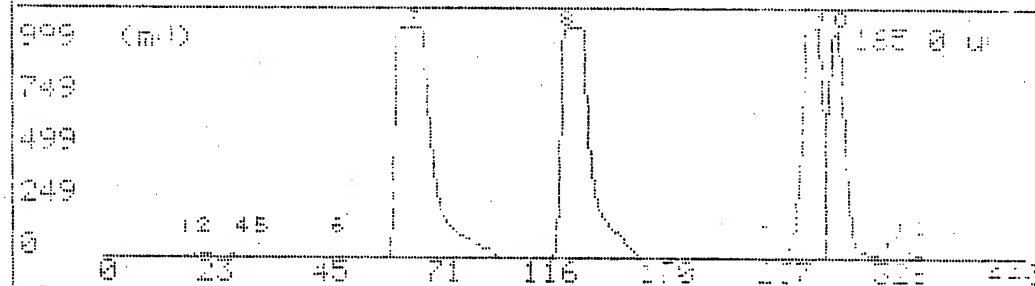
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.046 MVS	15.0
2	UNKNOWN	17.07 MVS	17.0
3	UNKNOWN	90.60 MVS	18.6
4	UNKNOWN	53.17 MVS	24.4
5	UNKNOWN	68.36 MVS	28.7
6	UNKNOWN	15.38 MVS	45.0
7	BENZENE	5.453 PPM	59.6
8	TOLUENE	8.451 PPM	119.2
9	UNKNOWN	6.588 MVS	211.0
10	ETHYLBENZENE	9.865 PPM	246.4
11	M,P-XYLENE	8.935 PPM	264.2
12	O-XYLENE	6.312 PPM	309.0

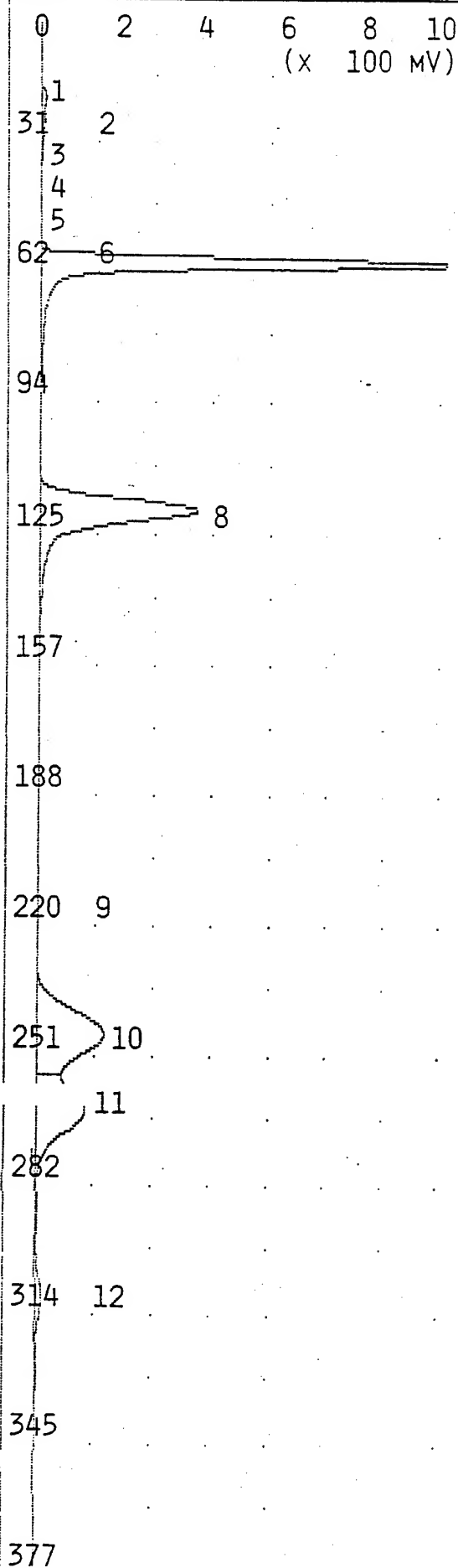
NOTES

JOE BYRD, JR.
DULUTH ANGB
10 PPM BTEX

G.I. Ready		195+ 60 Function	21	2.95	12.15
Analysis No 4		Run at	10	10	10
Pk No	Name	Conc/Area			
4	Unknown	53.17 mUS	-	-	
5	Unknown	60.36 mUS	-	-	
6	Unknown	13.38 mUS	-	-	
7	benzene	10.00 ppm	-	-	
8	toluene	10.00 ppm	-	-	
9	Unknown	10.00 mUS	-	-	
10	ethylbenzene	10.00 ppm	-	-	
11	m-xylene	10.00 ppm	-	-	
12	o-xylene	10.00 ppm	-	-	
- Detected 12 peaks. Use + + to zoom					



ANALYSIS #5 10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 5,95 13:10
SAMPLE TIME: MAY 5,95 13:02

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000
ANALYSIS TIME 440.0 SEC

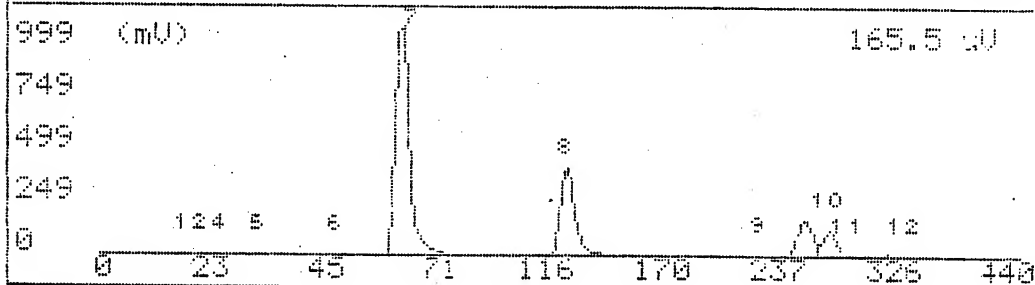
PEAK REPORT

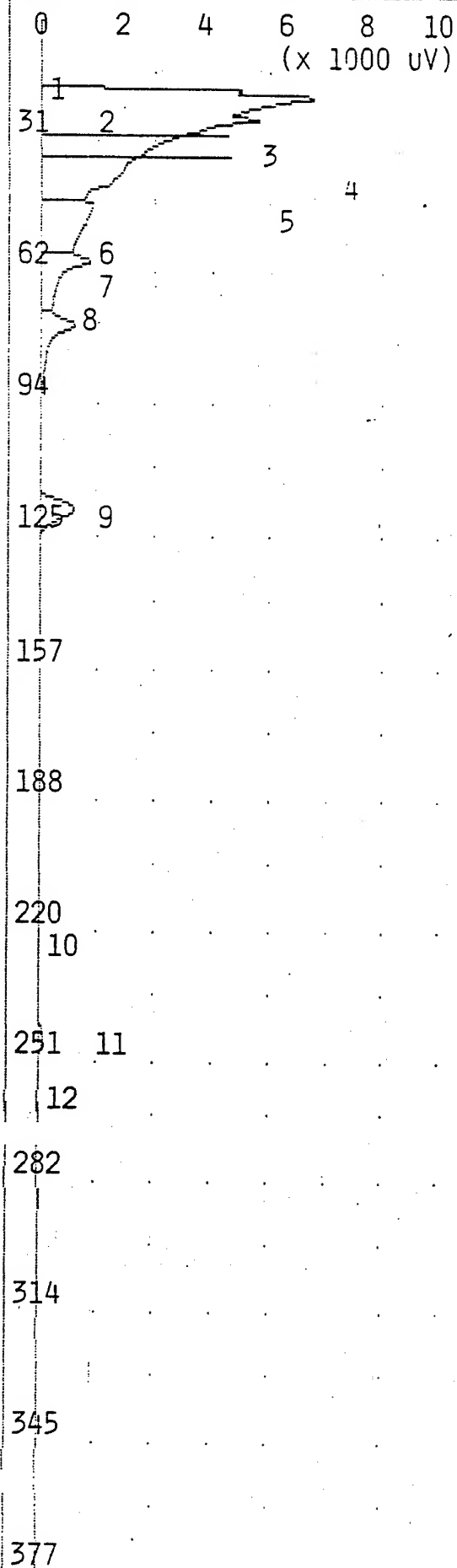
PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.057 MVS	15.1
2	UNKNOWN	16.91 MVS	17.0
3	UNKNOWN	57.57 MVS	18.6
4	UNKNOWN	36.89 MVS	24.3
5	UNKNOWN	55.05 MVS	28.8
6	UNKNOWN	17.90 MVS	44.8
7	BENZENE	1.231 PPM	58.8
8	TOLUENE	1.111 PPM	117.8
9	UNKNOWN	0.829 MVS	210.6
10	ETHYLBENZENE	1.074 PPM	244.0
11	M,P-XYLENE	1.310 PPM	259.4
12	O-XYLENE	1.060 PPM	307.7

NOTES

JOE BYRD, JR.
DULUTH ANGB
1 PPM BTEX

G.C. Ready		108+ GC Function	May 5, 95	10:14
-- Analysis No 5		-- Run at --	May 5, 95	13:01
Pk No	Name	Conc/Area	Alarm	Ret. Time
4	Unknown	36.89 mUS	-No-	34.3 sec
5	Unknown	55.85 mUS	-No-	36.00 sec
6	Unknown	17.96 mUS	-No-	44.00 sec
7	benzene	999.9 ppb	-No-	50.00 sec
8	toluene	1.000 ppm	-No-	67.00 sec
9	Unknown	0.829 mUS	-No-	216.00 sec
10	ethylbenzene	1.000 ppm	-No-	244.00 sec
11	m,p-xylene	2.000 ppm	-No-	259.4 sec
12	o-xylene	1.000 ppm	-No-	307.7 sec
- Detected 12 peaks. Use + + to scroll [445 sec]				





TIME PRINTED: MAY 5,95 13:24

SAMPLE TIME: MAY 5,95 13:17

METHOD

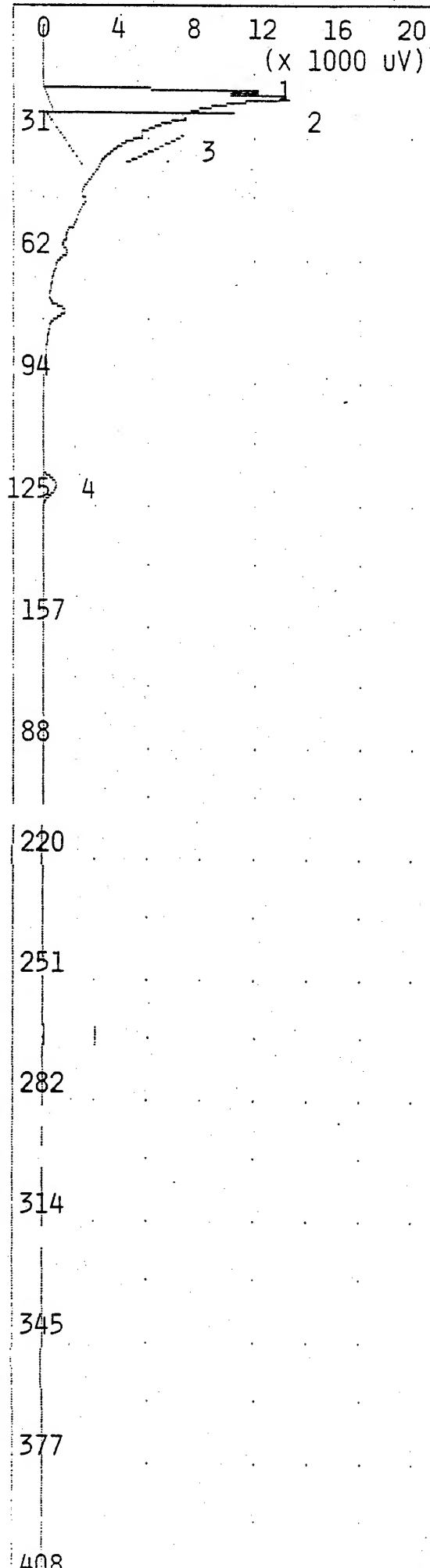
SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000
ANALYSIS TIME 440.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.021 MVS	13.3
2	UNKNOWN	0.059 MVS	15.5
3	UNKNOWN	5.599 MVS	17.2
4	UNKNOWN	33.16 MVS	18.8
5	UNKNOWN	58.27 MVS	24.2
6	UNKNOWN	14.17 MVS	44.8
7	BENZENE	3.586 PPB	58.2
8	UNKNOWN	5.698 MVS	72.9
9	TOLUENE	4.090 PPB	116.9
10	UNKNOWN	0.604 MVS	219.2
11	ETHYLBENZENE	6.202 PPB	243.7
12	M,P-XYLENE	13.28 PPB	261.8

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK



TIME PRINTED: MAY 5,95 13:35

SAMPLE TIME: MAY 5,95 13:28

METHOD

SLOPE UP 3.500 MV/SEC

SLOPE DOWN 10.50 MV/SEC

MIN AREA 0.000 MVSEC

MIN HEIGHT 0.000 MV

ANALYSIS DELAY 0.0 SEC

WINDOW PERCENT 10.0 %

DET FLOW 12 ML/MIN

B/F FLOW 12 ML/MIN

AUX FLOW 0 ML/MIN

OVEN TEMP 40 C

AMB TEMP 31 C

MAX GAIN 1000

ANALYSIS TIME 440.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	16.23 MVS	17.0
2	UNKNOWN	89.25 MVS	18.6
3	UNKNOWN	0.487 MVS	24.2
4	TOLUENE	3.253 PPB	118.6

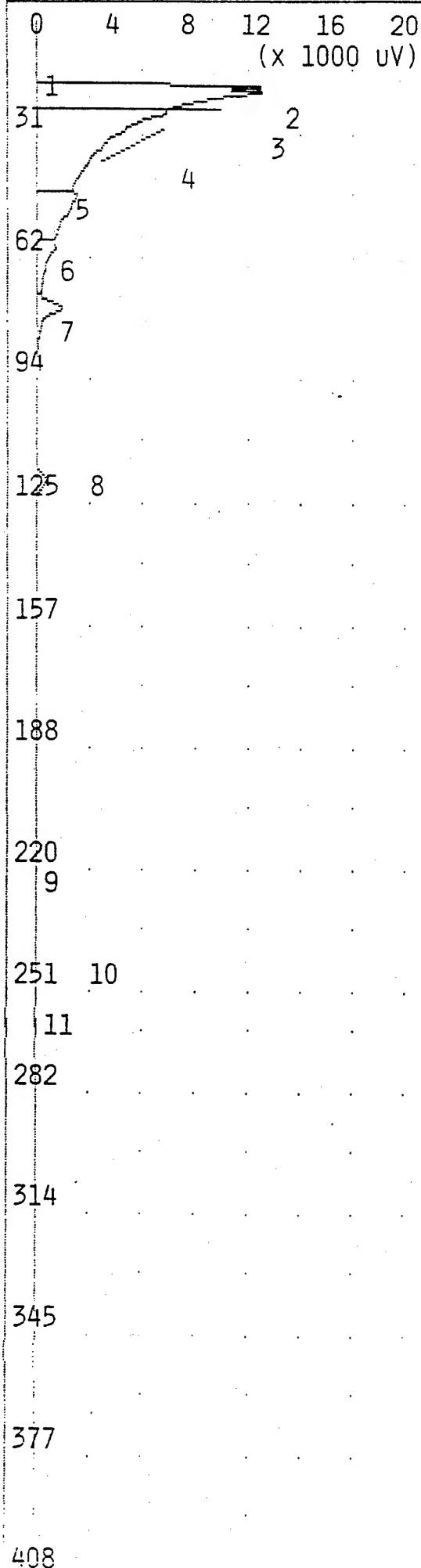
NOTES

JOE BYRD, JR.

DULUTH ANGB

026-001MW

1.0- 2.0 10G



TIME PRINTED: MAY 5,95 13:46

SAMPLE TIME: MAY 5,95 13:39

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 32 C
MAX GAIN 1000
ANALYSIS TIME 440.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.071 MVS	14.5
2	UNKNOWN	16.13 MVS	17.0
3	UNKNOWN	131.0 MVS	18.6
4	UNKNOWN	0.543 MVS	24.0
5	UNKNOWN	21.36 MVS	44.9
6	BENZENE	3.592 PPB	58.2
7	UNKNOWN	8.024 MVS	73.6
8	TOLUENE	2.854 PPB	118.0
9	UNKNOWN	2.154 MVS	219.2
10	ETHYLBENZENE	3.111 PPB	245.6
11	M,P-XYLENE	5.708 PPB	261.0

NOTES

JOE BYRD, JR.

DULUTH ANGB

026-001MW

5.0- 7.0 10G

0 4 8 12 16 20
(x 1000 UV)

TIME PRINTED: MAY 5,95 13:57

SAMPLE TIME: MAY 5,95 13:50

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 32 C
MAX GAIN 1000
ANALYSIS TIME 440.0 SEC

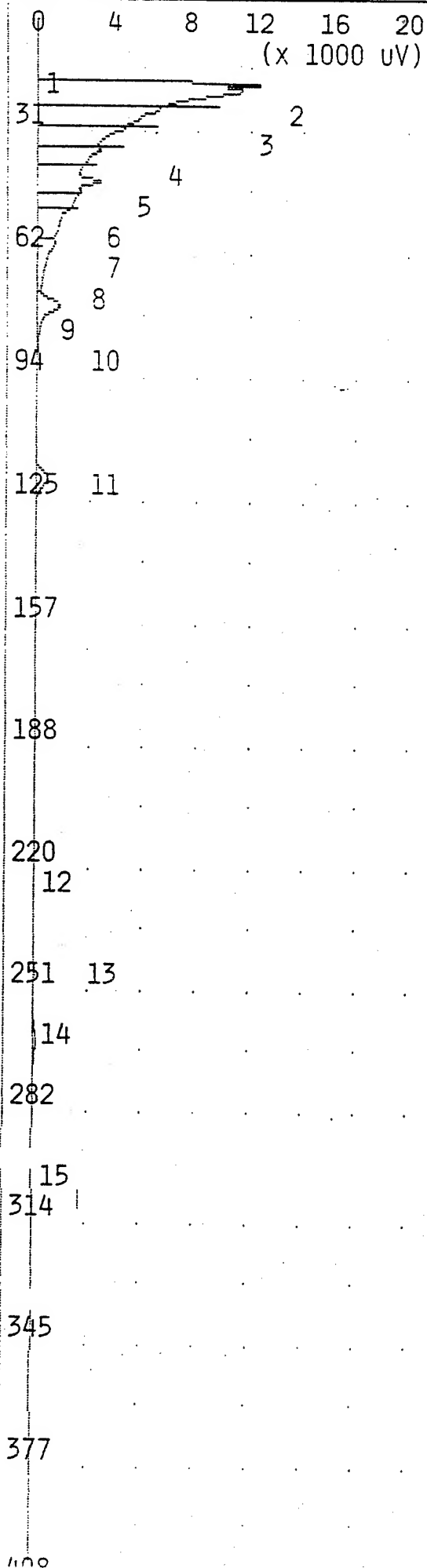
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.036 MVS	13.2
2	UNKNOWN	0.107 MVS	15.4
3	UNKNOWN	15.60 MVS	17.0
4	UNKNOWN	50.46 MVS	18.6
5	UNKNOWN	29.63 MVS	24.2
6	UNKNOWN	41.96 MVS	28.8
7	UNKNOWN	6.564 MVS	42.2
8	UNKNOWN	21.19 MVS	44.6
9	BENZENE	3.097 PPB	58.2
10	UNKNOWN	11.87 MVS	73.4
11	TOLUENE	2.977 PPB	117.3
12	UNKNOWN	2.619 MVS	213.0
13	ETHYLBENZENE	2.198 PPB	245.0
14	M,P-XYLENE	6.394 PPB	261.0
15	O-XYLENE	5.036 PPB	299.2

NOTES

JOE BYRD, JR.
DULUTH ANGB
026-001MW
10.0-12.0 10g

ANALYSIS #10 10S+ GC FUNCTION ANALYSIS REPORT



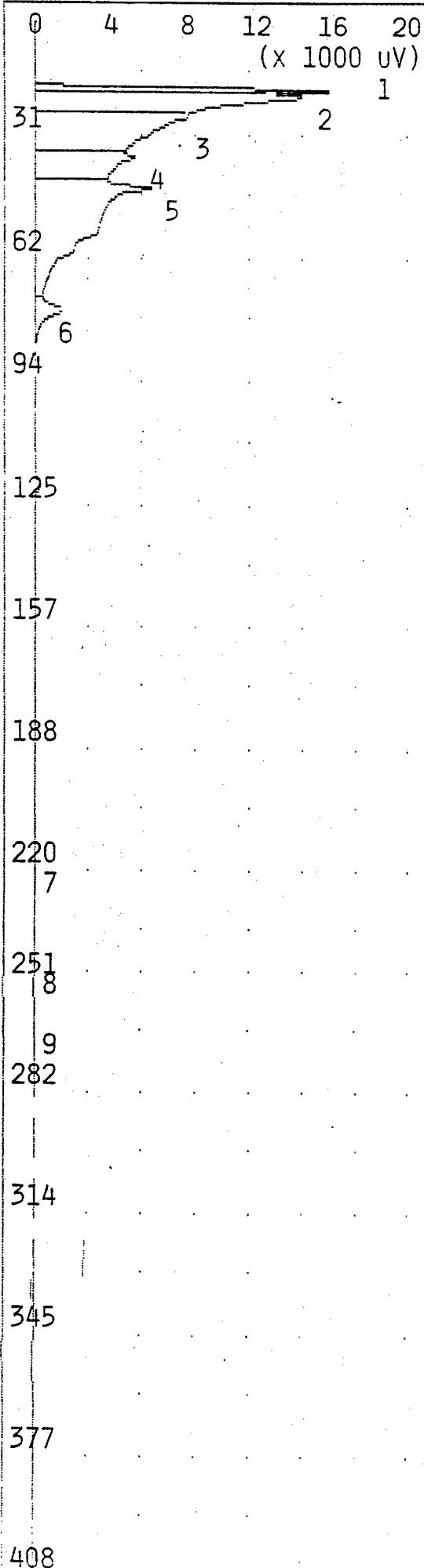
TIME PRINTED: MAY 5,95 14:08
 SAMPLE TIME: MAY 5,95 14:01
 METHOD
 SLOPE UP 0.500 MV/SEC
 SLOPE DOWN 1.500 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 12 ML/MIN
 B/F FLOW 12 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 32 C
 MAX GAIN 1000
 ANALYSIS TIME 440.0 SEC

PEAK REPORT			
PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.104 MVS	15.3
2	UNKNOWN	16.73 MVS	17.0
3	UNKNOWN	49.92 MVS	19.0
4	UNKNOWN	27.33 MVS	24.0
5	UNKNOWN	19.98 MVS	28.6
6	UNKNOWN	20.61 MVS	34.1
7	UNKNOWN	10.60 MVS	42.2
8	UNKNOWN	21.18 MVS	44.6
9	BENZENE	2.955 PPB	58.0
10	UNKNOWN	6.841 MVS	73.4
11	TOLUENE	3.365 PPB	117.7
12	UNKNOWN	2.170 MVS	219.4
13	ETHYLBENZENE	2.637 PPB	244.5
14	M,P-XYLENE	9.060 PPB	261.0
15	O-XYLENE	8.235 PPB	299.7

NOTES

JOE BYRD, JR.
 DULUTH ANGB
 026-001MW
 12.5-14.5 10G

ANALYSIS #11 10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 5,95 14:19

SAMPLE TIME: MAY 5,95 14:12

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000
ANALYSIS TIME 440.0 SEC

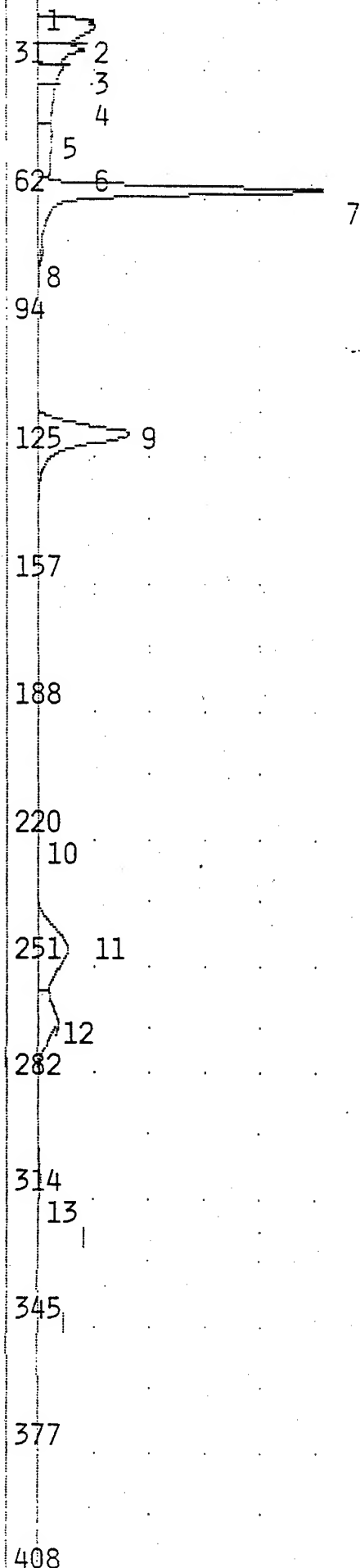
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	23.28 MVS	17.7
2	UNKNOWN	63.67 MVS	19.5
3	UNKNOWN	63.73 MVS	24.8
4	UNKNOWN	33.38 MVS	35.0
5	UNKNOWN	86.99 MVS	42.8
6	UNKNOWN	14.85 MVS	74.0
7	UNKNOWN	10.06 MVS	219.8
8	ETHYLBENZENE	5.634 PPB	246.9
9	M,P-XYLENE	12.66 PPB	265.8

NOTES

JOE BYRD, JR.
DULUTH ANGB
026-001MW
15.0-17.0 10G

ANALYTeic #12 10S+ GC FUNCTION ANALYSIS REPORT

0 2 4 6 8 10
(X 10 MV)TIME PRINTED: MAY 5,95 14:30
SAMPLE TIME: MAY 5,95 14:23

METHOD

SLOPE UP	0.500	MV/SEC
SLOPE DOWN	1.500	MV/SEC
MIN AREA	0.000	MVSEC
MIN HEIGHT	0.000	MV
ANALYSIS DELAY	0.0	SEC
WINDOW PERCENT	10.0	%
DET FLOW	12	ML/MIN
B/F FLOW	12	ML/MIN
AUX FLOW	0	ML/MIN
OVEN TEMP	40	C
AMB TEMP	31	C
MAX GAIN	1000	
ANALYSIS TIME	440.0	SEC

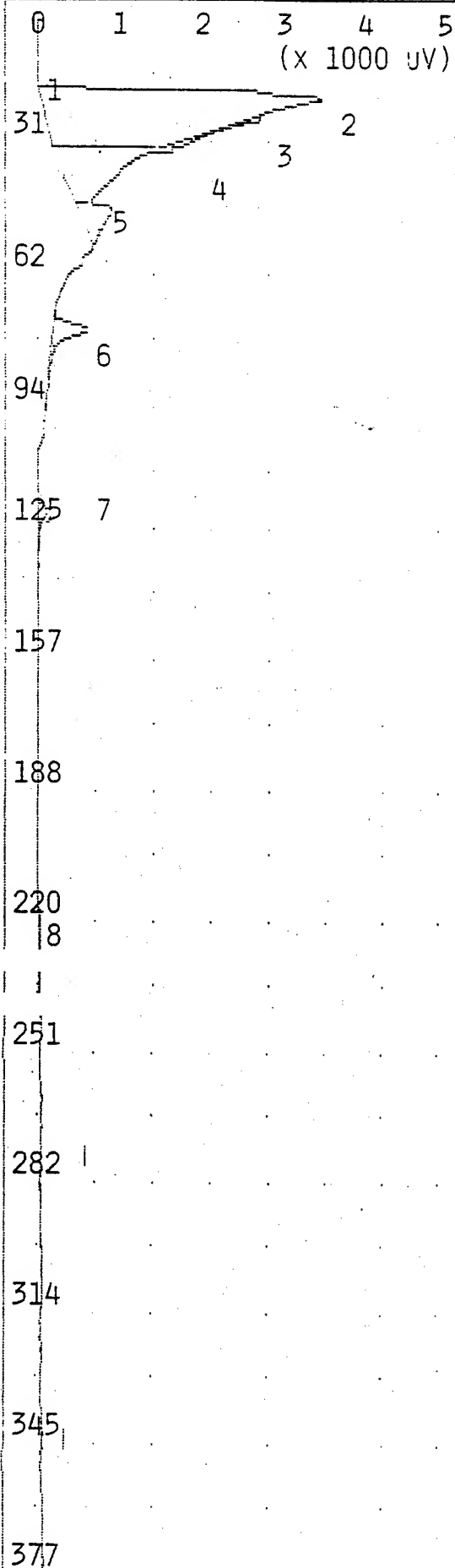
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.063 MVS	15.0
2	UNKNOWN	20.57 MVS	17.1
3	UNKNOWN	63.82 MVS	18.6
4	UNKNOWN	40.08 MVS	24.4
5	UNKNOWN	70.89 MVS	28.8
6	UNKNOWN	47.49 MVS	45.0
7	BENZENE	99.93 PPB	58.6
8	UNKNOWN	1.494 MVS	73.6
9	TOLUENE	95.88 PPB	118.1
10	UNKNOWN	7.576 MVS	219.4
11	ETHYLBENZENE	106.2 PPB	245.0
12	M,P-XYLENE	216.4 PPB	263.4
13	O-XYLENE	115.1 PPB	309.6

NOTES

JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX

ANALYSIS #13 10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 5,95 14:42

SAMPLE TIME: MAY 5,95 14:35

METHOD

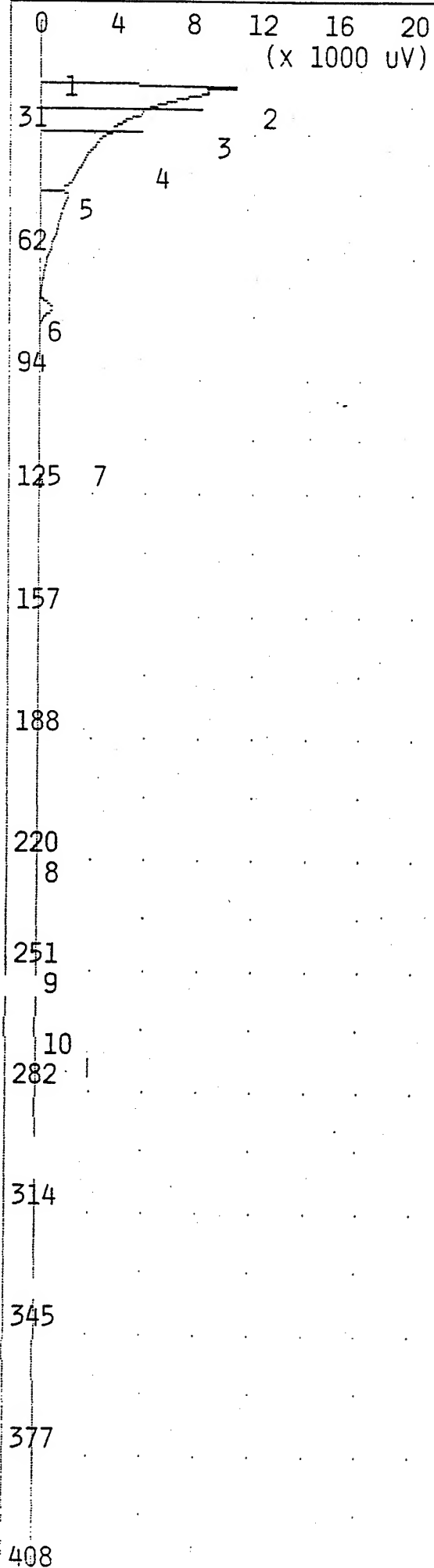
SLOPE UP 0.500 MV/SEC
 SLOPE DOWN 1.500 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 12 ML/MIN
 B/F FLOW 12 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 31 C
 MAX GAIN 1000
 ANALYSIS TIME 440.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.037 MVS	15.0
2	UNKNOWN	37.15 MVS	18.6
3	UNKNOWN	0.826 MVS	24.4
4	UNKNOWN	8.563 MVS	31.5
5	UNKNOWN	2.321 MVS	45.2
6	UNKNOWN	1.706 MVS	73.7
7	TOLUENE	0.729 PPB	118.5
8	UNKNOWN	0.451 MVS	218.6

NOTES

JOE BYRD, JR.
 DULUTH ANGB
 AIR BLANK



TIME PRINTED: MAY 5,95 14:53

SAMPLE TIME: MAY 5,95 14:45

METHOD

SLOPE UP 0.500 MV/SEC
 SLOPE DOWN 1.500 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 12 ML/MIN
 B/F FLOW 12 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 31 C
 MAX GAIN 1000
 ANALYSIS TIME 440.0 SEC

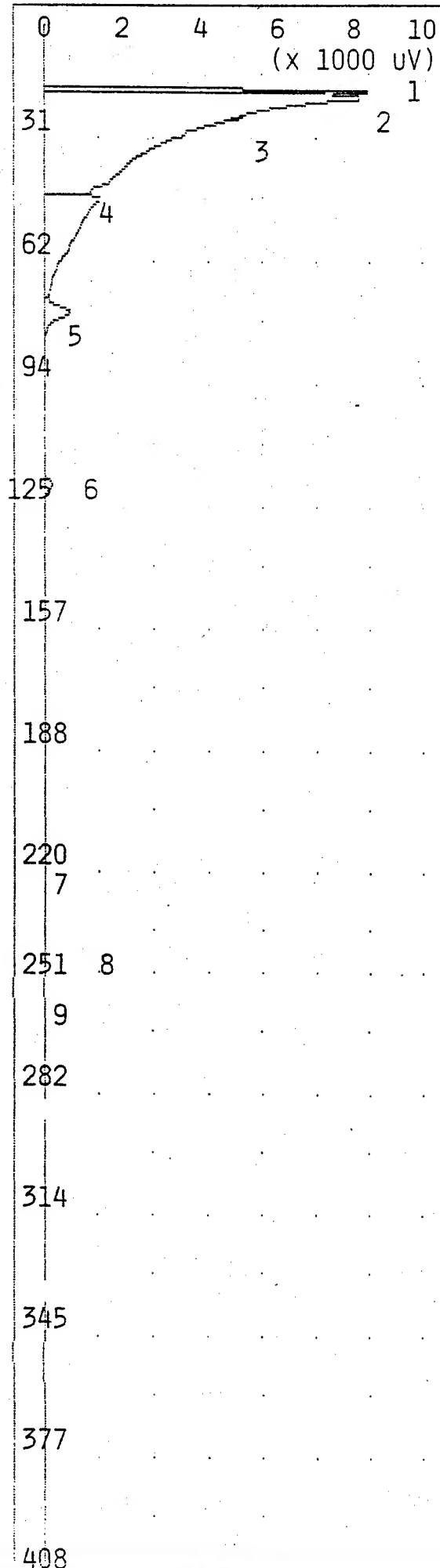
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.127 MVS	15.4
2	UNKNOWN	14.43 MVS	17.0
3	UNKNOWN	42.18 MVS	18.6
4	UNKNOWN	62.32 MVS	24.2
5	UNKNOWN	23.02 MVS	45.2
6	UNKNOWN	4.527 MVS	73.8
7	TOLUENE	2.123 PPB	118.4
8	UNKNOWN	1.504 MVS	218.6
9	ETHYLBENZENE	1.180 PPB	248.8
10	M,P-XYLENE	3.769 PPB	264.5

NOTES

JOE BYRD, JR.
 DULUTH ANGB
 026-001MW
 20.0-22.0 10G

ANALYSIS #15 10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 5,95 15:04

SAMPLE TIME: MAY 5,95 14:56

METHOD

SLOPE UP 0.500 MV/SEC

SLOPE DOWN 1.500 MV/SEC

MIN AREA 0.000 MVSEC

MIN HEIGHT 0.000 MV

ANALYSIS DELAY 0.0 SEC

WINDOW PERCENT 10.0 %

DET FLOW 12 ML/MIN

B/F FLOW 12 ML/MIN

AUX FLOW 0 ML/MIN

OVEN TEMP 40 C

AMB TEMP 31 C

MAX GAIN 1000

ANALYSIS TIME 440.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	11.79 MVS	17.0
2	UNKNOWN	99.93 MVS	19.0
3	UNKNOWN	0.232 MVS	24.0
4	UNKNOWN	21.68 MVS	45.0
5	UNKNOWN	4.262 MVS	73.7
6	TOLUENE	1.845 PPB	118.5
7	UNKNOWN	1.310 MVS	218.6
8	ETHYLBENZENE	0.787 PPB	243.7
9	M,P-XYLENE	2.676 PPB	261.6

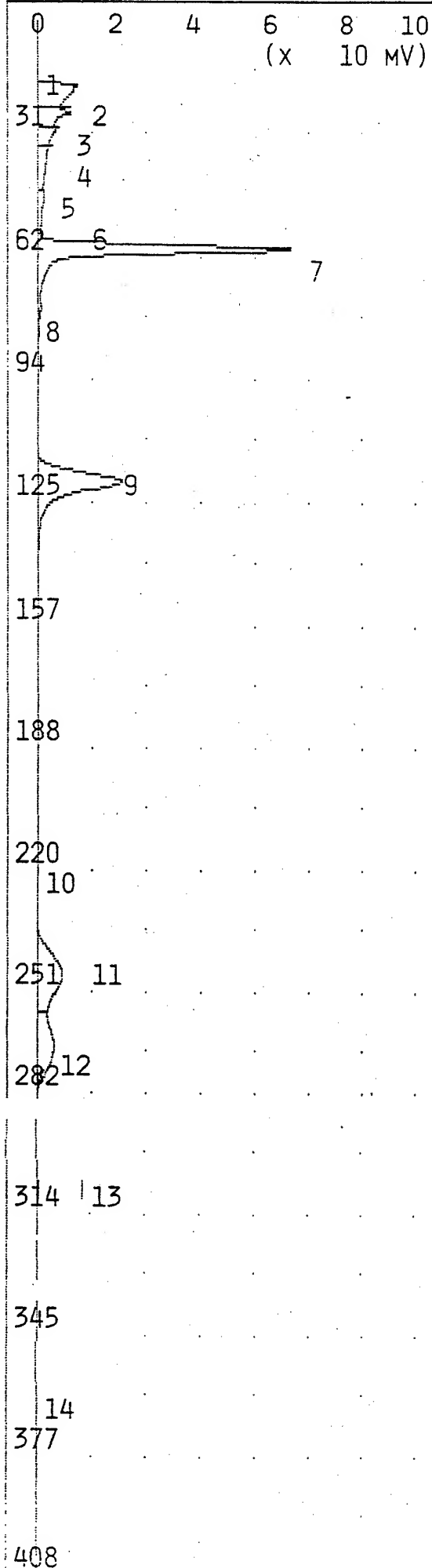
NOTES

JOE BYRD, JR.

DULUTH ANGB

026-001MW

24.0-26.0 10G



TIME PRINTED: MAY 5,95 15:43

SAMPLE TIME: MAY 5,95 15:36

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000
ANALYSIS TIME 440.0 SEC

PEAK REPORT

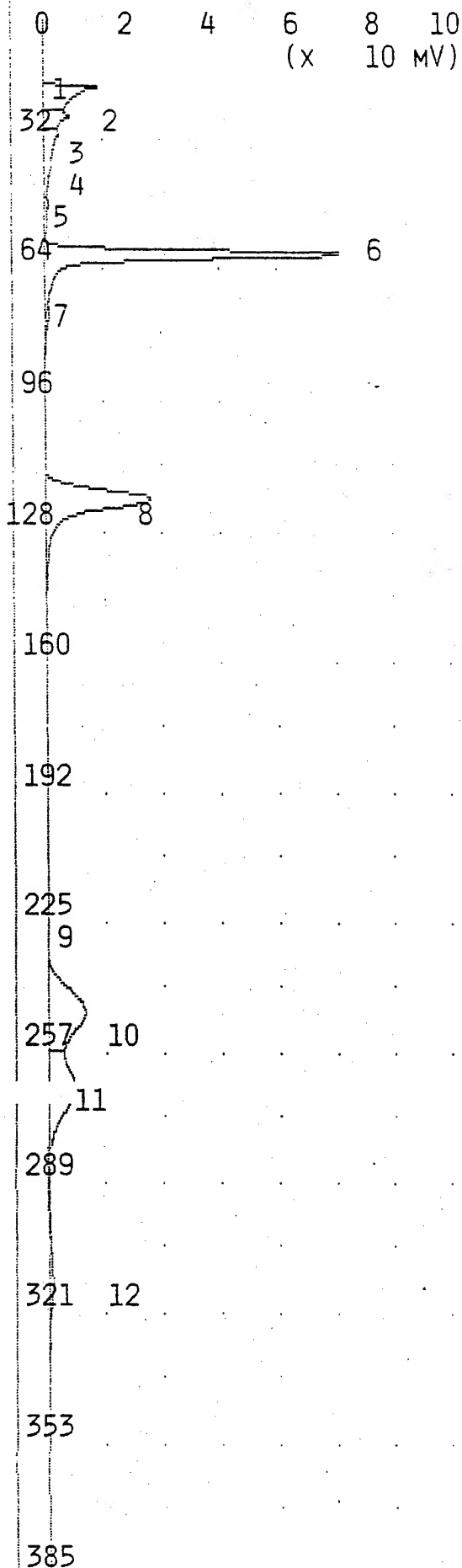
PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.050 MVS	15.4
2	UNKNOWN	14.91 MVS	17.0
3	UNKNOWN	41.23 MVS	18.5
4	UNKNOWN	29.35 MVS	24.3
5	UNKNOWN	46.76 MVS	28.8
6	UNKNOWN	16.81 MVS	44.6
7	BENZENE	84.43 PPB	58.6
8	UNKNOWN	1.497 MVS	73.7
9	TOLUENE	90.34 PPB	118.0
10	UNKNOWN	11.32 MVS	218.8
11	ETHYLBENZENE	101.7 PPB	245.0
12	M,P-XYLENE	214.6 PPB	263.2
13	O-XYLENE	174.3 PPB	308.8
14	UNKNOWN	6.110 MVS	356.3

NOTES

JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX

ANALYSIS #1

10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 6,95 14:12

SAMPLE TIME: MAY 6,95 14:04

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000
ANALYSIS TIME 450.0 SEC

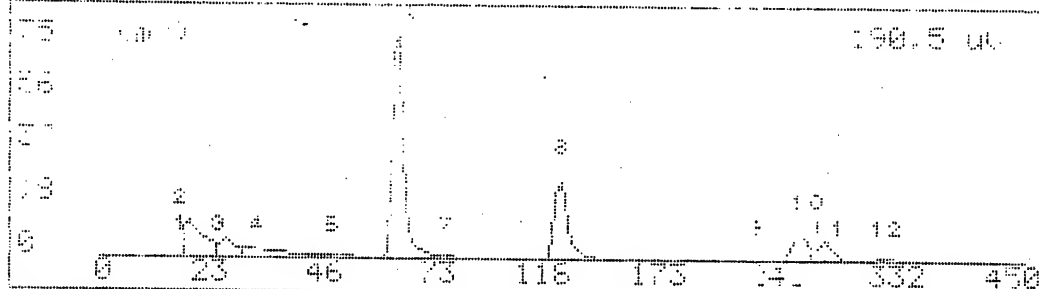
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.052 MVS	15.2
2	UNKNOWN	54.75 MVS	17.0
3	UNKNOWN	22.54 MVS	24.2
4	UNKNOWN	36.42 MVS	28.9
5	UNKNOWN	9.592 MVS	46.1
6	UNKNOWN	220.1 MVS	58.7
7	UNKNOWN	1.278 MVS	73.8
8	UNKNOWN	171.3 MVS	118.1
9	UNKNOWN	0.605 MVS	222.0
10	UNKNOWN	123.0 MVS	244.8
11	UNKNOWN	97.45 MVS	263.2
12	UNKNOWN	18.42 MVS	308.8

NOTES

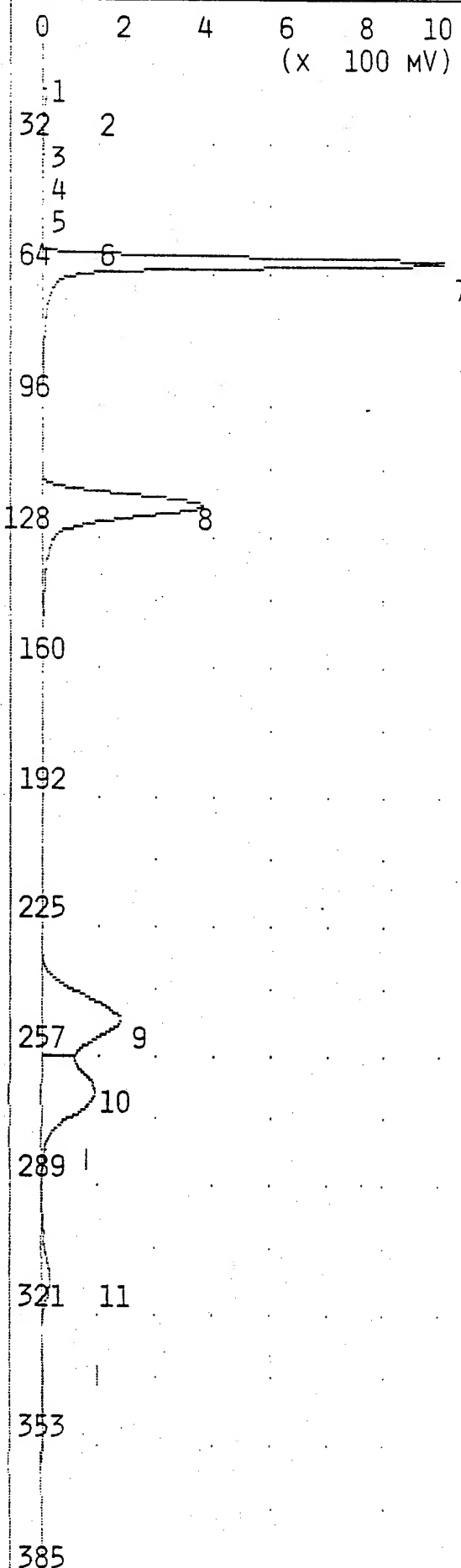
Joe Byrd, JR
Duluth AUGB
100 PPB BTX

G.C. Ready		106+ GC Function		1.95	14:28
Analysis No 1		Run at - Mar		1.95	14:04
PK No	Name	Conc/Area	Unit	Ret. Time	
4	Unknown	36.42	µUS	20.9	sec
5	Unknown	0.592	µUS	26.4	sec
6	benzene	100.0	ppb	30.4	sec
7	Unknown	1.278	µUS	33.0	sec
8	toluene	100.0	ppb	40.1	sec
9	Unknown	0.605	µUS	42.0	sec
10	ethylbenzene	100.0	ppb	44.3	sec
11	m,p-xylene	200.0	ppb	46.3	sec
12	o-xylene	100.0	ppb	48.0	sec
Detected 12 peaks; Use * + to sort:					



ANALYSIS #2

10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 6,95 14:29
SAMPLE TIME: MAY 6,95 14:22

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000
ANALYSIS TIME 450.0 SEC

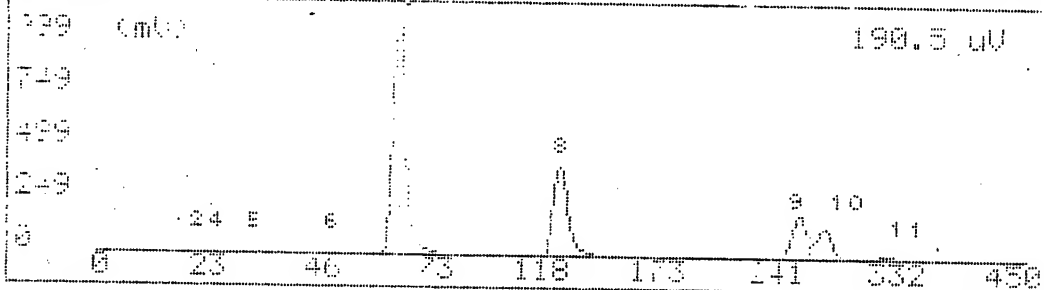
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.056 MVS	15.4
2	UNKNOWN	16.47 MVS	17.0
3	UNKNOWN	48.43 MVS	18.6
4	UNKNOWN	30.64 MVS	24.4
5	UNKNOWN	41.80 MVS	28.8
6	UNKNOWN	7.712 MVS	45.8
7	BENZENE	1.712 PPM	59.2
8	TOLUENE	1.721 PPM	118.6
9	ETHYLBENZENE	2.143 PPM	245.6
10	M,P-XYLENE	3.989 PPM	264.0
11	O-XYLENE	2.266 PPM	309.6

NOTES

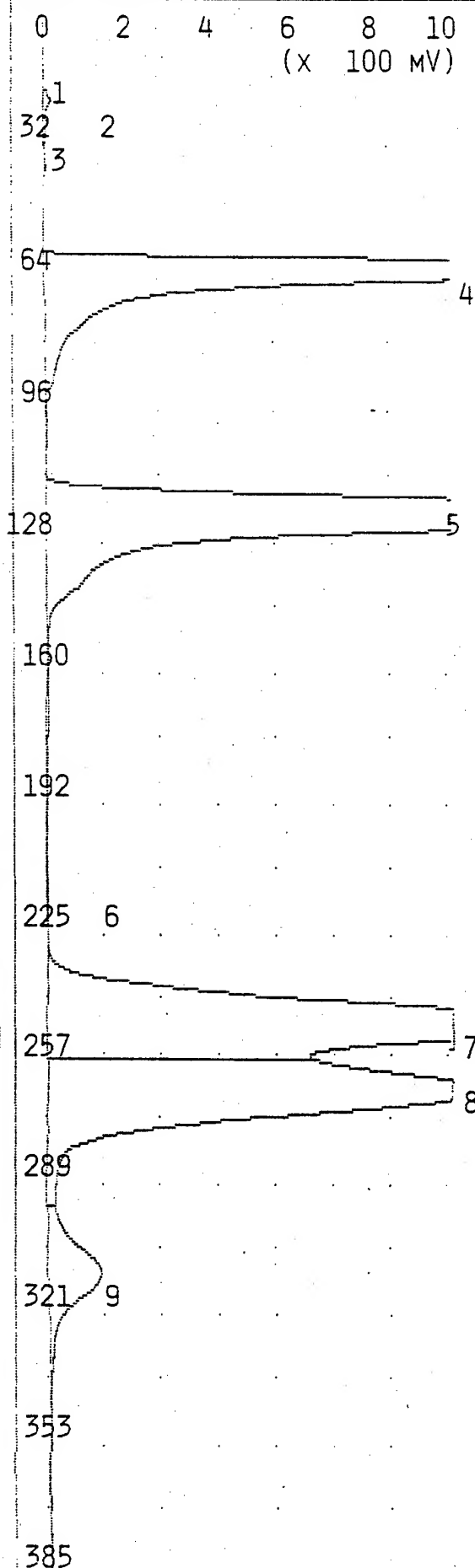
JOE BYRD, JR.
DULUTH ANGB
1 PPM BTEX

B.C. Ready		1st- GD Function		Date: 5-95 14:39	
-- Analysis No 2		-- Run at - May 11-95		14:22	
PK No	Name	Conc	Area	Class	Ret. Time
1	Unknown	46.44	µUS	-No-	10.6 sec
2	Unknown	13.64	µUS	-No-	26.4 sec
3	Unknown	41.84	µUS	-No-	20.3 sec
4	Unknown	7.752	µUS	-No-	40.0 sec
5	Benzene	1.000	ppm	-No-	50.2 sec
6	Toluene	1.000	ppm	-No-	100.0 sec
7	ethylbenzene	1.000	ppm	-No-	140.0 sec
8	m-xylene	2.000	ppm	-No-	204.0 sec
9	o-xylene	1.000	ppm	-No-	300.0 sec
Detected 11 peaks. Use + + to scroll.					455 sec



ANALYSIS #3

10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 6,95 14:48

SAMPLE TIME: MAY 6,95 14:41

METHOD

SLOPE UP 4.000 MV/SEC
 SLOPE DOWN 12.00 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 12 ML/MIN
 B/F FLOW 12 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 31 C
 MAX GAIN 1000

ANALYSIS TIME 450.0 SEC

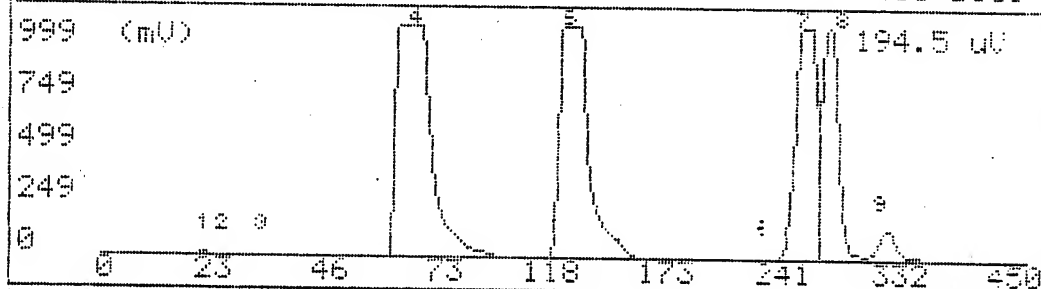
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	88.35 MVS	18.7
2	UNKNOWN	31.64 MVS	24.4
3	UNKNOWN	18.93 MVS	28.9
4	BENZENE	4.293 PPM	60.0
5	TOLUENE	6.586 PPM	119.3
6	UNKNOWN	5.591 MVS	212.6
7	ETHYLBENZENE	7.985 PPM	246.1
8	M,P-XYLENE	15.28 PPM	263.7
9	O-XYLENE	5.526 PPM	308.8

NOTES

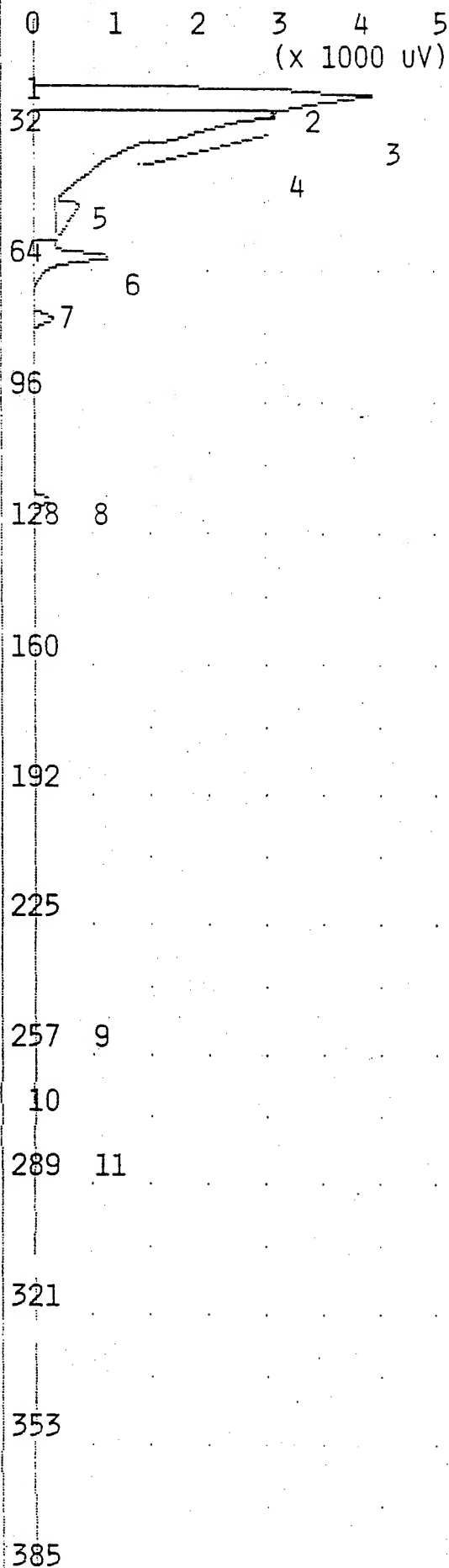
JOE BYRD, JR.
 DULUTH ANGB
 10 PPM BTEX
 33

G.C. Ready		108+ GC Function	May 6, 95	14:35
-- Analysis No 3		-- Run at --	May 6, 95	14:41
Pk No	Name	Conc/Area	Disc	Ret. Time
1	Unknown	88.35	mUG	10.7
2	Unknown	31.64	mUG	14.4
3	Unknown	18.97	mUG	14.4
4	benzene	10.00	ppm	15.0
5	toluene	10.00	ppm	15.6
6	Unknown	5.59	mUG	15.6
7	ethylbenzene	10.00	ppm	16.1
8	m,p-xylene	20.00	ppm	16.7
9	o-xylene	10.00	ppm	17.0
- Detected 9 peaks.				



ANALYSIS #4

10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 6,95 15:04

SAMPLE TIME: MAY 6,95 14:56

METHOD

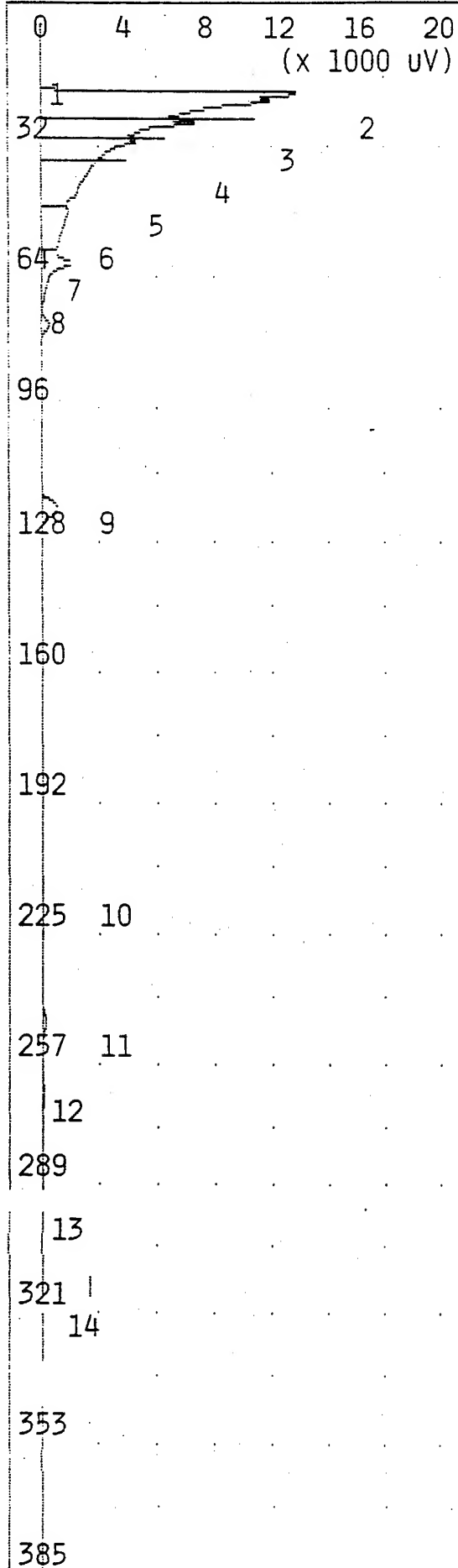
SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000
ANALYSIS TIME 450.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.035 MVS	15.0
2	UNKNOWN	3.828 MVS	17.4
3	UNKNOWN	61.37 MVS	13.9
4	UNKNOWN	0.887 MVS	24.2
5	UNKNOWN	1.597 MVS	46.9
6	BENZENE	4.051 PPB	59.0
7	UNKNOWN	4.909 MVS	74.1
8	TOLUENE	2.628 PPB	118.2
9	ETHYLBENZENE	8.036 PPB	244.8
10	M,P-XYLENE	20.56 PPB	262.4
11	UNKNOWN	2.611 MVS	276.5

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK



TIME PRINTED: MAY 6,95 15:15

SAMPLE TIME: MAY 6,95 15:07

METHOD

SLOPE UP	0.500	MV/SEC
SLOPE DOWN	1.500	MV/SEC
MIN AREA	0.000	MVSEC
MIN HEIGHT	0.000	MV
ANALYSIS DELAY	0.0	SEC
WINDOW PERCENT	10.0	%
DET FLOW	12	ML/MIN
B/F FLOW	12	ML/MIN
AUX FLOW	0	ML/MIN
OVEN TEMP	40	C
AMB TEMP	31	C
MAX GAIN	1000	
ANALYSIS TIME	450.0	SEC

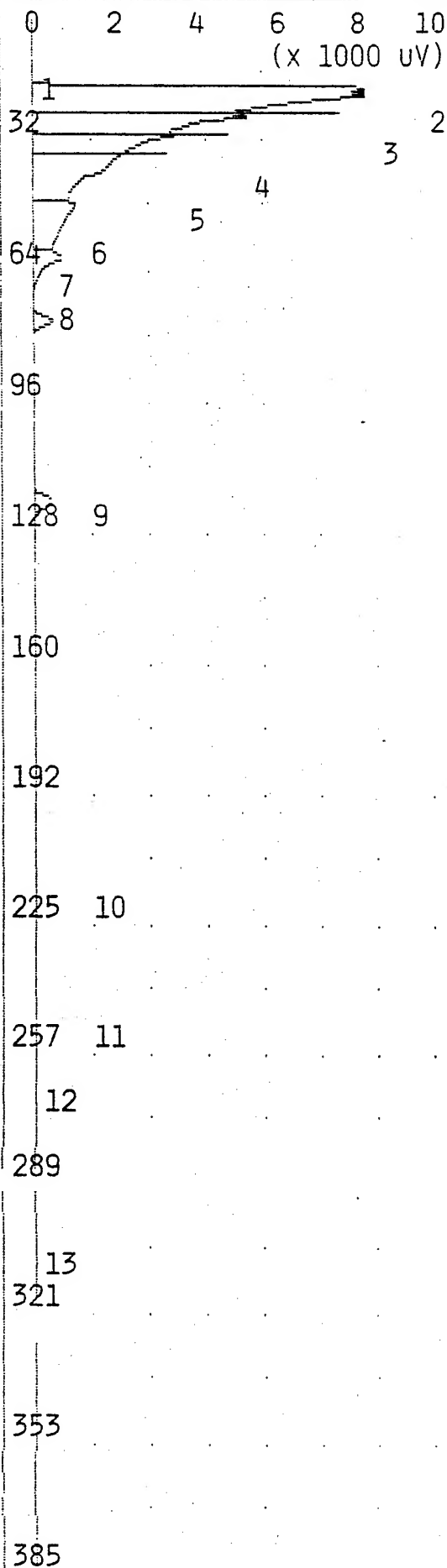
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.039 MVS	15.2
2	UNKNOWN	19.40 MVS	17.2
3	UNKNOWN	47.14 MVS	19.0
4	UNKNOWN	27.92 MVS	24.4
5	UNKNOWN	46.99 MVS	29.0
6	UNKNOWN	14.15 MVS	46.0
7	BENZENE	5.185 PPB	58.7
8	UNKNOWN	5.073 MVS	73.8
9	TOLUENE	4.483 PPB	118.4
10	UNKNOWN	0.857 MVS	217.6
11	ETHYLBENZENE	5.565 PPB	244.8
12	M,P-XYLENE	25.66 PPB	263.2
13	O-XYLENE	4.846 PPB	298.6
14	UNKNOWN	0.793 MVS	320.0

NOTES

JOE BYRD, JR.
DULUTH ANGB
026-003MW
0.5- 2.5 10G

ANALYSIS #6 10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 6,95 15:26

SAMPLE TIME: MAY 6,95 15:18

METHOD

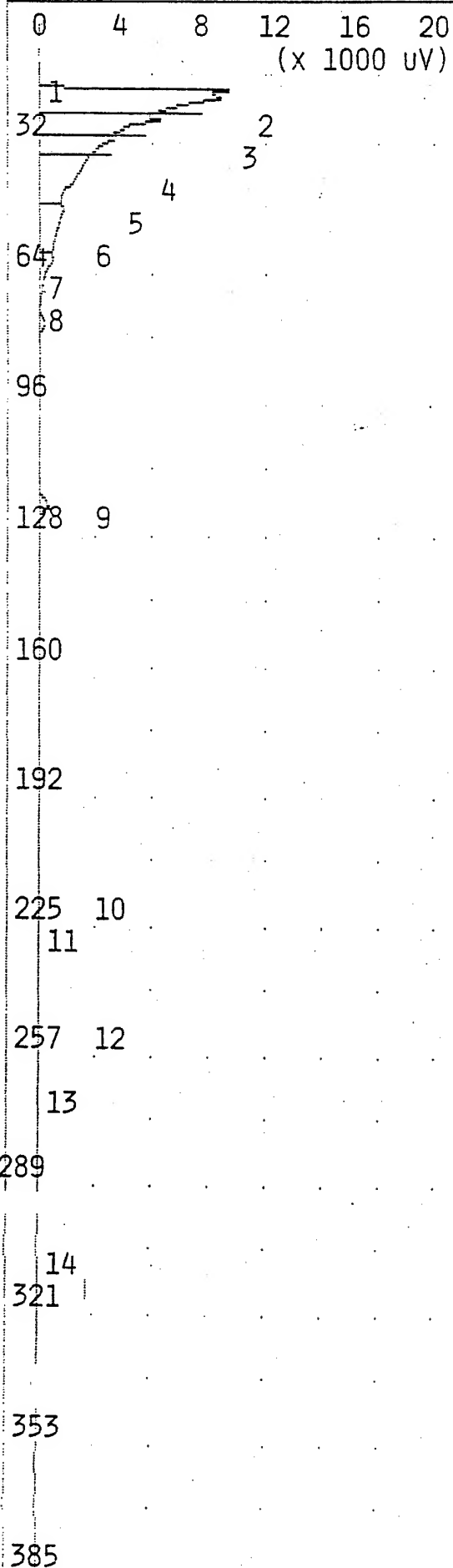
SLOPE UP 0.500 MV/SEC
 SLOPE DOWN 1.500 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 12 ML/MIN
 B/F FLOW 12 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 32 C
 MAX GAIN 1000
 ANALYSIS TIME 450.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.062 MVS	15.1
2	UNKNOWN	12.69 MVS	17.2
3	UNKNOWN	37.68 MVS	18.8
4	UNKNOWN	21.67 MVS	24.3
5	UNKNOWN	36.54 MVS	28.8
6	UNKNOWN	12.38 MVS	45.8
7	BENZENE	3.038 PPB	58.7
8	UNKNOWN	4.963 MVS	73.8
9	TOLUENE	3.301 PPB	118.9
10	UNKNOWN	62.07 MVS	214.8
11	ETHYLBENZENE	10.46 PPB	246.4
12	M,P-XYLENE	24.58 PPB	264.2
13	O-XYLENE	26.56 PPB	307.2

NOTES

JOE BYRD, JR.
 DULUTH ANGB
 026-003MW
 5.0- 7.0 10g



TIME PRINTED: MAY 6,95 15:37

SAMPLE TIME: MAY 6,95 15:29

METHOD

SLOPE UP 0.500 MV/SEC
 SLOPE DOWN 1.500 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 12 ML/MIN
 B/F FLOW 12 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 32 C
 MAX GAIN 1000
 ANALYSIS TIME 450.0 SEC

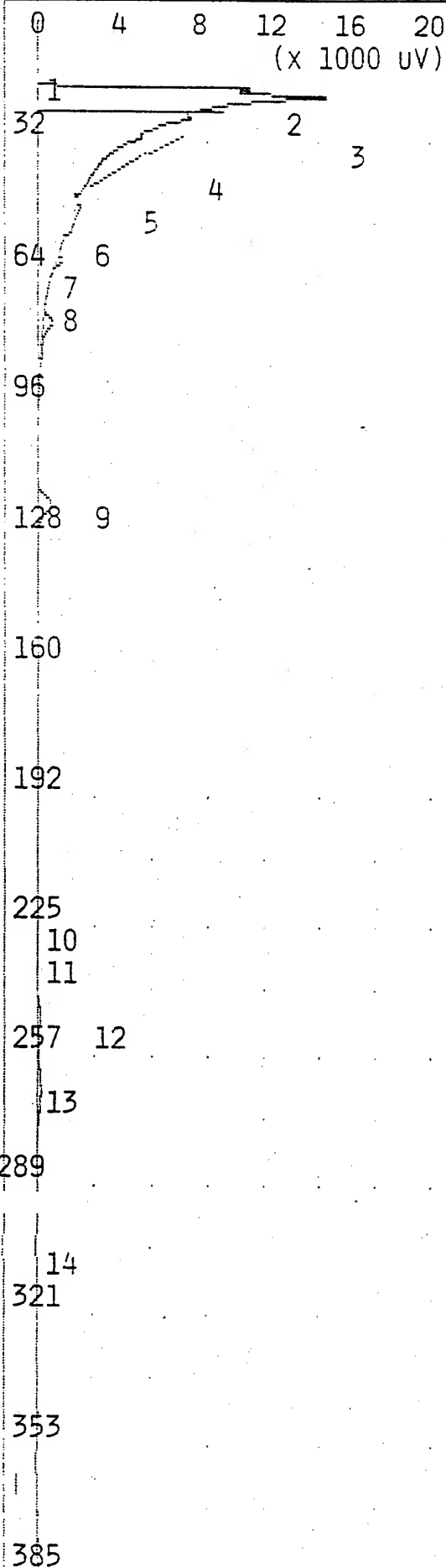
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.044 MVS	15.0
2	UNKNOWN	13.20 MVS	17.0
3	UNKNOWN	41.40 MVS	18.8
4	UNKNOWN	23.35 MVS	24.3
5	UNKNOWN	39.98 MVS	28.8
6	UNKNOWN	13.45 MVS	45.8
7	BENZENE	2.672 PPB	58.8
8	UNKNOWN	2.669 MVS	73.8
9	TOLUENE	2.630 PPB	119.2
10	UNKNOWN	7.318 MVS	218.0
11	UNKNOWN	9.277 MVS	227.0
12	ETHYLBENZENE	10.93 PPB	245.3
13	M,P-XYLENE	31.80 PPB	265.3
14	O-XYLENE	28.49 PPB	305.6

NOTES

JOE BYRD, JR.
 DULUTH ANGB
 026-003MW
 10.0-12.0 10G

ANALYSIS #8 10S+ GC FUNCTION ANALYSIS REPORT

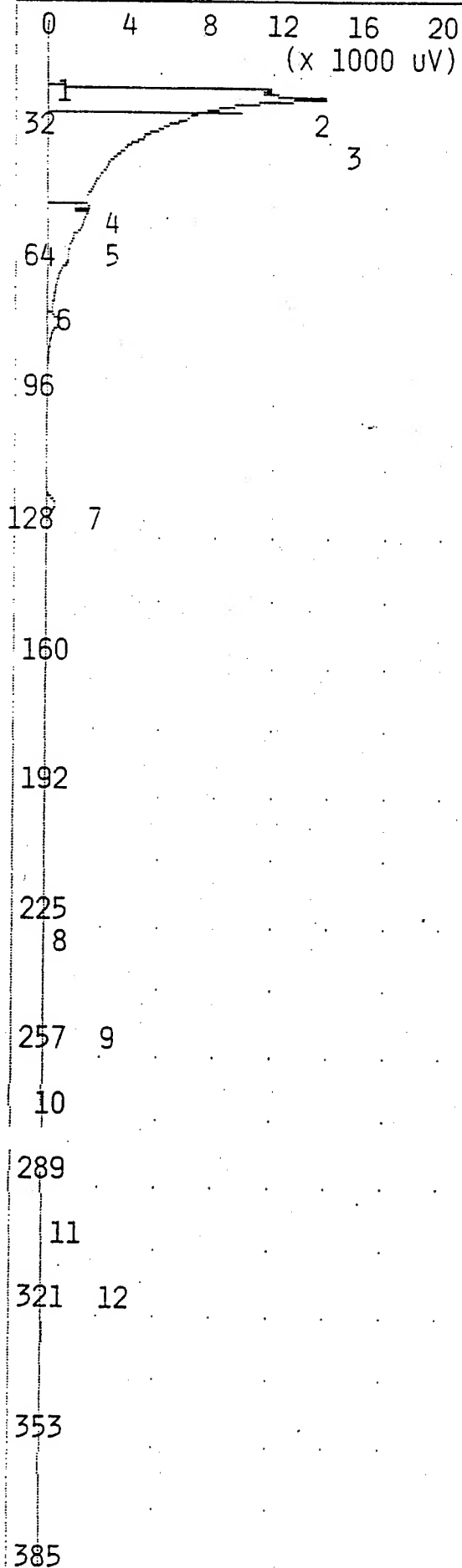


TIME PRINTED: MAY 6,95 15:48
 SAMPLE TIME: MAY 6,95 15:40
 METHOD
 SLOPE UP 0.500 MV/SEC
 SLOPE DOWN 1.500 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 12 ML/MIN
 B/F FLOW 12 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 32 C
 MAX GAIN 1000
 ANALYSIS TIME 450.0 SEC

PEAK REPORT			
PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.073 MVS	15.4
2	UNKNOWN	14.66 MVS	17.1
3	UNKNOWN	179.2 MVS	18.8
4	UNKNOWN	1.237 MVS	24.4
5	UNKNOWN	0.375 MVS	28.9
6	UNKNOWN	1.424 MVS	45.8
7	BENZENE	0.219 PPB	58.8
8	UNKNOWN	1.723 MVS	74.2
9	TOLUENE	3.058 PPB	118.5
10	UNKNOWN	12.68 MVS	220.6
11	UNKNOWN	10.55 MVS	221.2
12	ETHYLBENZENE	12.44 PPB	247.2
13	M,P-XYLENE	30.50 PPB	262.9
14	O-XYLENE	32.28 PPB	306.9

NOTES

JOE BYRD, JR.
 DULUTH ANGB
 026-002MW
 0.5- 2.5 10G



TIME PRINTED: MAY 6,95 15:59

SAMPLE TIME: MAY 6,95 15:51

METHOD

SLOPE UP 0.500 MV/SEC

SLOPE DOWN 1.500 MV/SEC

MIN AREA 0.000 MVSEC

MIN HEIGHT 0.000 MV

ANALYSIS DELAY 0.0 SEC

WINDOW PERCENT 10.0 %

DET FLOW 12 ML/MIN

B/F FLOW 12 ML/MIN

AUX FLOW 0 ML/MIN

OVEN TEMP 40 C

AMB TEMP 32 C

MAX GAIN 1000

ANALYSIS TIME 450.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.055 MVS	15.6
2	UNKNOWN	16.14 MVS	17.2
3	UNKNOWN	140.7 MVS	18.8
4	UNKNOWN	29.08 MVS	46.4
5	BENZENE	0.065 PPB	58.7
6	UNKNOWN	4.194 MVS	74.0
7	TOLUENE	2.309 PPB	118.8
8	UNKNOWN	3.213 MVS	220.0
9	ETHYLBENZENE	3.285 PPB	247.4
10	M,P-XYLENE	15.49 PPB	263.2
11	UNKNOWN	0.819 MVS	294.1
12	O-XYLENE	16.70 PPB	310.4

NOTES

JOE BYRD, JR.

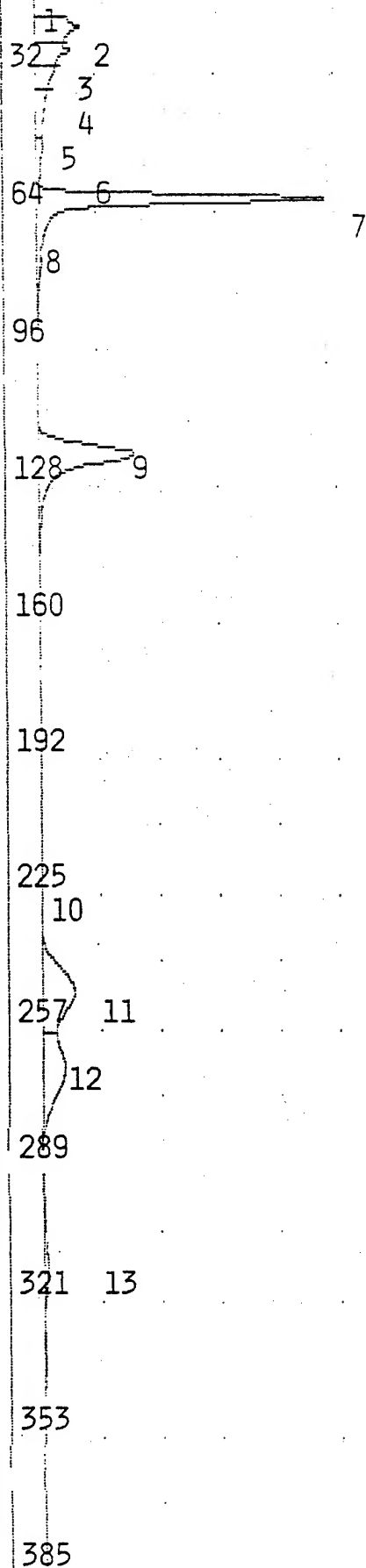
DULUTH ANGB

026-002MW

5.0- 7.0 10G

ANALYSIS #10

10S+ GC FUNCTION ANALYSIS REPORT

0 2 4 6 8 10
(X 10 MV)

TIME PRINTED: MAY 6,95 16:10

SAMPLE TIME: MAY 6,95 16:02

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 32 C
MAX GAIN 1000
ANALYSIS TIME 450.0 SEC

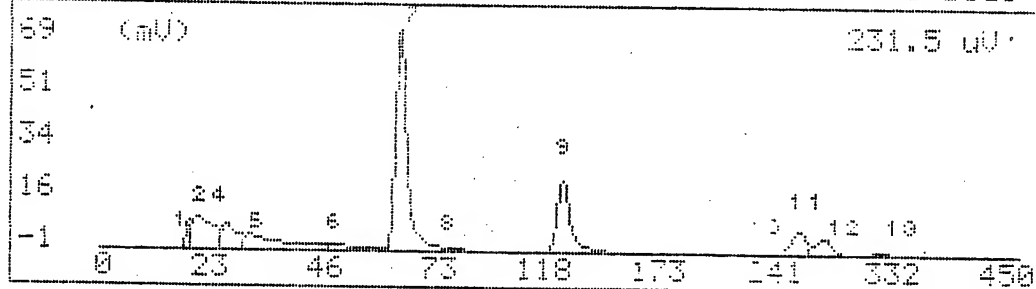
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.043 MVS	15.4
2	UNKNOWN	11.21 MVS	17.2
3	UNKNOWN	47.49 MVS	18.8
4	UNKNOWN	31.49 MVS	24.5
5	UNKNOWN	49.65 MVS	29.2
6	UNKNOWN	16.18 MVS	45.8
7	BENZENE	99.53 PPB	59.0
8	UNKNOWN	1.135 MVS	74.0
9	TOLUENE	90.08 PPB	118.5
10	UNKNOWN	1.173 MVS	221.0
11	ETHYLBENZENE	86.17 PPB	245.8
12	M,P-XYLENE	169.0 PPB	264.2
13	O-XYLENE	77.83 PPB	310.4

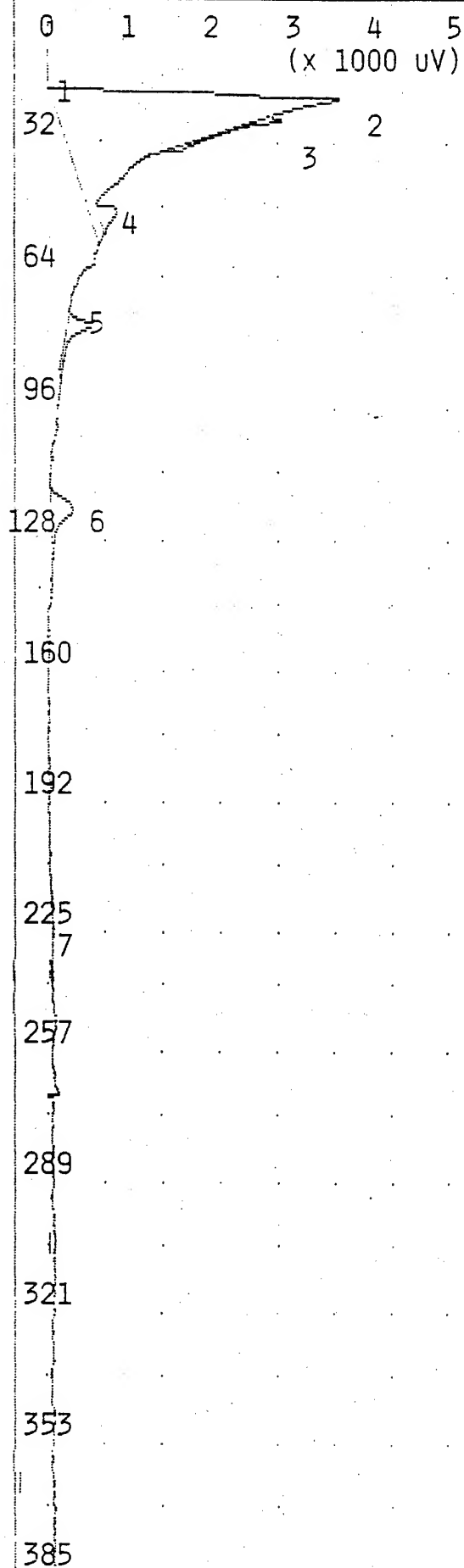
NOTES

JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX

G.C. Ready		105- GC Function		Sta.	6.45	16:15
-- Analysis No 10		-- Run at --		Day	10/95	16:02
Pk No	Name	Conc/Area	Class	Ret. Time		
5	Unknown	49.65 mUs	17	28.2	sec	
6	Unknown	46.18 mUs	17	40.0	sec	
7	benzene	99.99 ppb	17	50.0	sec	
8	Unknown	1.13 mUs	17	74.0	sec	
9	toluene	100.0 ppb	17	110.0	sec	
10	Unknown	1.17 mUs	17	221.0	sec	
11	ethylbenzene	100.0 ppb	17	340.0	sec	
12	m,p-xylene	100.0 ppb	17	364.2	sec	
13	o-xylene	100.0 ppb	17	380.4	sec	
- Detected 13 peaks. Use + + to scroll. [455 sec]						



ANALYSIS #11 10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 6,95 16:24
SAMPLE TIME: MAY 6,95 16:16

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 32 C
MAX GAIN 1000
ANALYSIS TIME 450.0 SEC

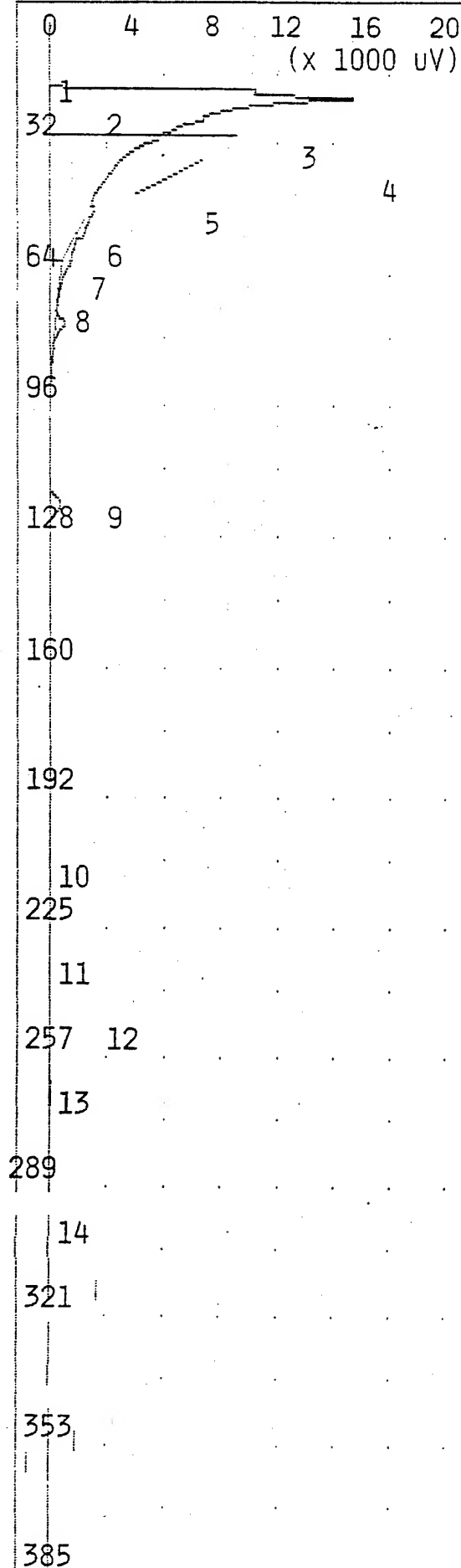
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.036 MVS	15.1
2	UNKNOWN	47.07 MVS	19.0
3	UNKNOWN	0.948 MVS	24.3
4	UNKNOWN	1.060 MVS	46.6
5	UNKNOWN	1.159 MVS	74.6
6	TOLUENE	1.214 PPB	118.6
7	ETHYLBENZENE	0.196 PPB	221.8

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK

ANALYSIS #12 10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 6,95 16:35

SAMPLE TIME: MAY 6,95 16:27

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 32 C
MAX GAIN 1000
ANALYSIS TIME 450.0 SEC

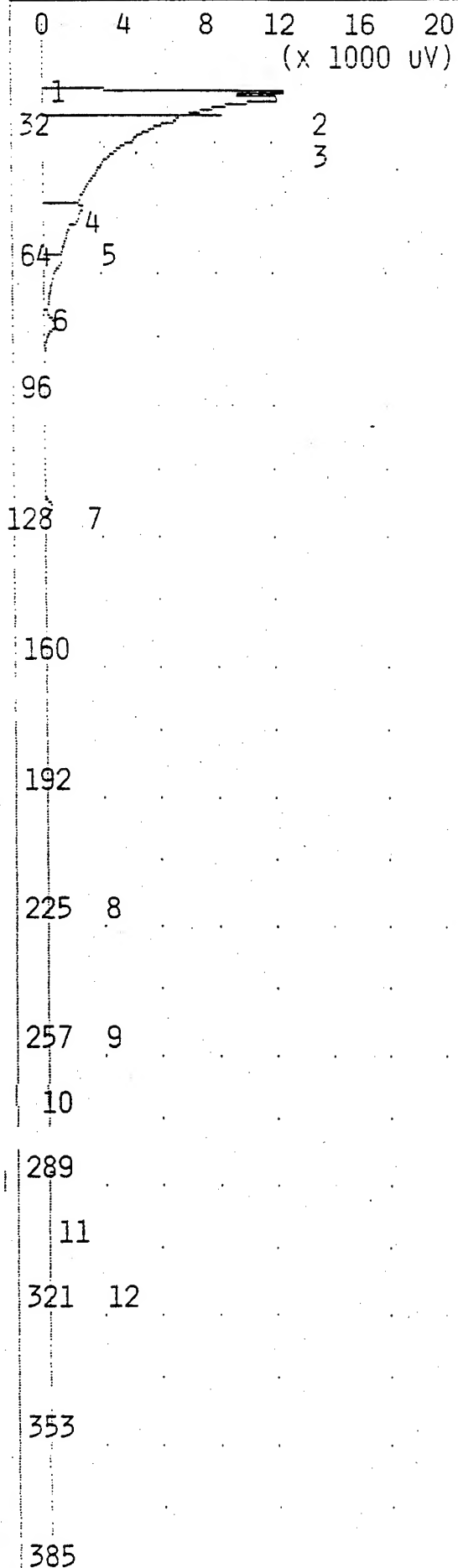
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.046 MVS	13.2
2	UNKNOWN	0.141 MVS	15.7
3	UNKNOWN	14.33 MVS	17.2
4	UNKNOWN	186.6 MVS	18.8
5	UNKNOWN	0.450 MVS	24.2
6	UNKNOWN	3.903 MVS	45.4
7	BENZENE	0.559 PPB	59.3
8	UNKNOWN	1.832 MVS	73.8
9	TOLUENE	3.005 PPB	118.6
10	UNKNOWN	1.907 MVS	204.2
11	UNKNOWN	0.129 MVS	233.6
12	ETHYLBENZENE	2.733 PPB	248.0
13	M,P-XYLENE	8.597 PPB	266.4
14	O-XYLENE	7.251 PPB	293.0

NOTES

JOE BYRD, JR.
DULUTH ANGB
026-002MW
10.0-12.0 10G

ANALYSIS #13 10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 6,95 16:46

SAMPLE TIME: MAY 5,95 16:38

METHOD

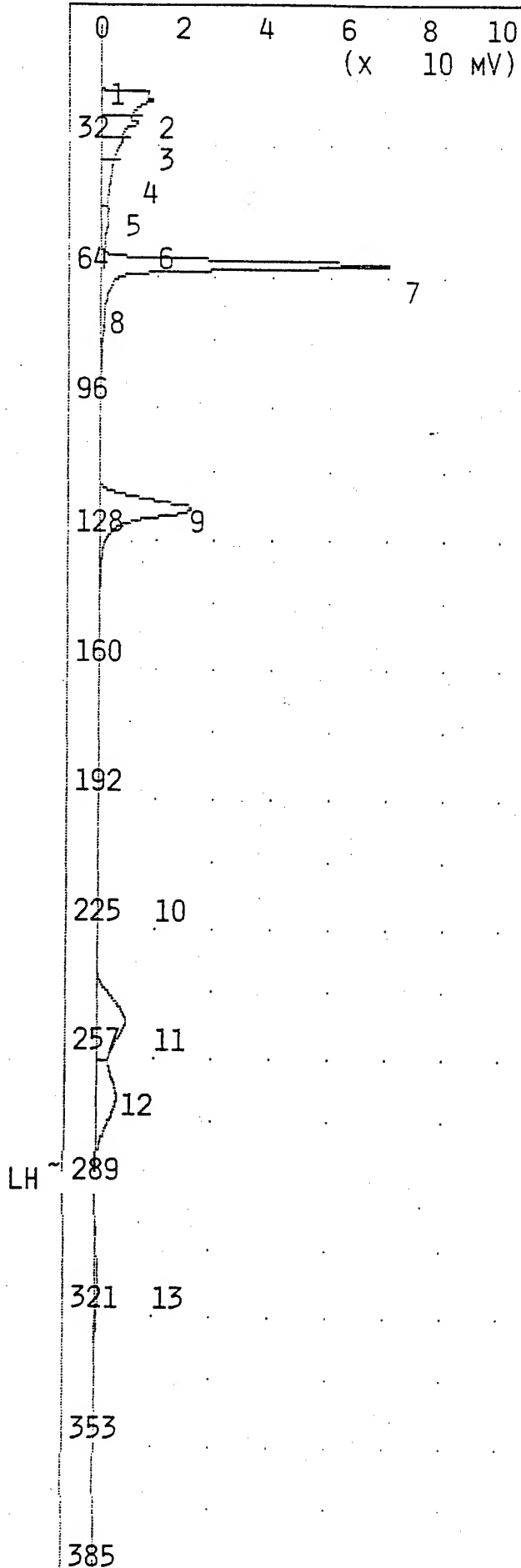
SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 32 C
MAX GAIN 1000
ANALYSIS TIME 450.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.062 MVS	16.0
2	UNKNOWN	14.80 MVS	17.6
3	UNKNOWN	128.4 MVS	19.2
4	UNKNOWN	19.73 MVS	46.6
5	BENZENE	3.345 PPB	58.8
6	UNKNOWN	4.052 MVS	74.2
7	TOLUENE	2.511 PPB	118.9
8	UNKNOWN	1.280 MVS	219.2
9	ETHYLBENZENE	1.660 PPB	245.0
10	M,P-XYLENE	7.493 PPB	264.2
11	UNKNOWN	0.300 MVS	295.4
12	O-XYLENE	4.160 PPB	313.3

NOTES

JOE BYRD, JR.
DULUTH ANGB
026-002MW
15.0-17.0 10G



TIME PRINTED: MAY 6,95 16:56

SAMPLE TIME: MAY 6,95 16:49

METHOD

SLOPE UP 0.500 MV/SEC
 SLOPE DOWN 1.500 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 12 ML/MIN
 B/F FLOW 12 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 32 C
 MAX GAIN 1000
 ANALYSIS TIME 450.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.037 MVS	15.2
2	UNKNOWN	17.16 MVS	17.2
3	UNKNOWN	54.15 MVS	18.8
4	UNKNOWN	34.42 MVS	24.6
5	UNKNOWN	54.19 MVS	29.0
6	UNKNOWN	18.71 MVS	45.8
7	BENZENE	99.81 PPB	59.0
8	UNKNOWN	0.464 MVS	73.8
9	TOLUENE	94.48 PPB	118.5
10	UNKNOWN	1.151 MVS	219.2
11	ETHYLBENZENE	91.20 PPB	245.8
12	M,P-XYLENE	184.7 PPB	264.5
13	O-XYLENE	96.60 PPB	310.4

NOTES

JOE BYRD, JR.
 DULUTH ANGB
 100 PPB BTEX

0 2 4 6 8 10
(x 10 MV)

TIME PRINTED: MAY 8,95 10:17

SAMPLE TIME: MAY 8,95 10:10

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000
ANALYSIS TIME 400.0 SEC

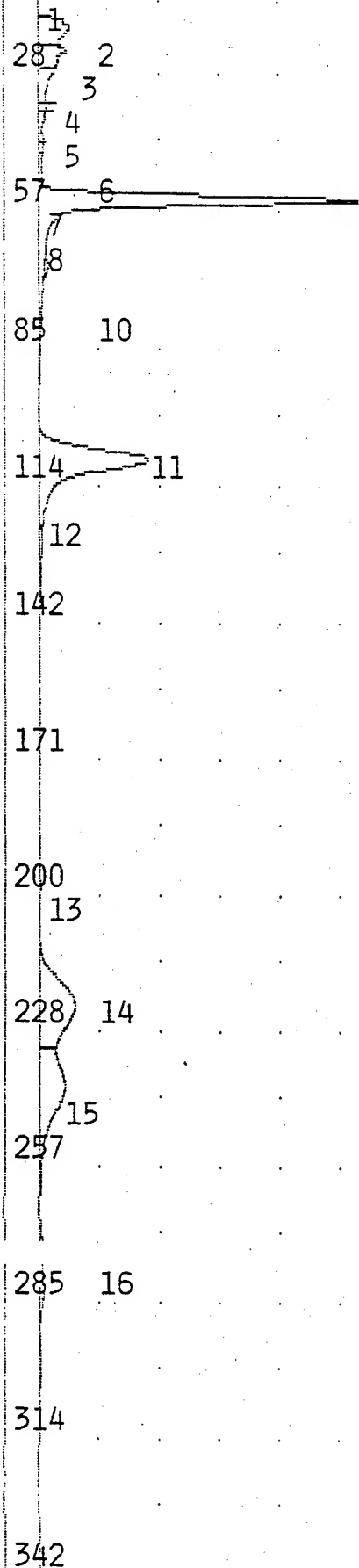
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.086 MVS	14.1
2	UNKNOWN	6.964 MVS	15.5
3	UNKNOWN	31.05 MVS	16.9
4	UNKNOWN	15.11 MVS	22.1
5	UNKNOWN	8.947 MVS	24.3
6	UNKNOWN	17.48 MVS	26.0
7	UNKNOWN	12.30 MVS	33.5
8	UNKNOWN	11.79 MVS	40.6
9	UNKNOWN	229.1 MVS	53.0
10	UNKNOWN	2.303 MVS	66.5
11	UNKNOWN	158.5 MVS	106.6
12	UNKNOWN	6.444 MVS	121.6
13	UNKNOWN	2.258 MVS	195.4
14	UNKNOWN	106.2 MVS	221.6
15	UNKNOWN	84.78 MVS	238.2
16	UNKNOWN	17.20 MVS	278.9

NOTES

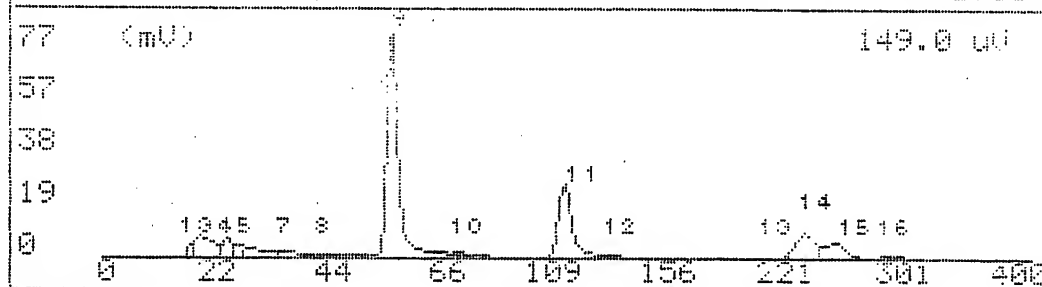
DESTROY GREENWAY (TRAINEE)
DULUTH ANGB
100 PPB BTEX

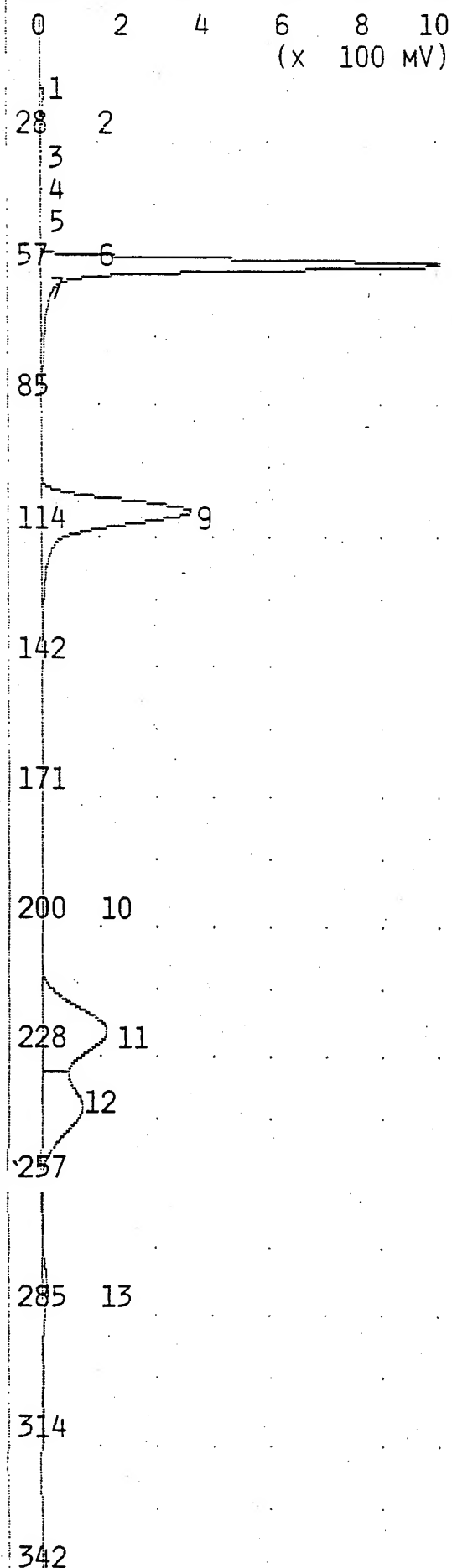
J. BYRD, JR. (OPERATOR)



LH

B.C. Ready		135- GC Function		Max 3.5	10:26
-- Analysis No 3		-- Run at --		May 10-55	10:10
Pk No	Name	Conc/Area	Height	Ret. Time	
8	Unknown	11.79	mUS	-No-	40.6 sec
9	benzene	100.0	ppb	-No-	50.6 sec
10	Unknown	2.303	mUS	-No-	66.5 sec
11	toluene	100.0	ppb	-No-	106.6 sec
12	Unknown	6.444	mUS	-No-	121.3 sec
13	Unknown	2.258	mUS	-No-	195.4 sec
14	ethylbenzene	100.0	ppb	-No-	221.6 sec
15	m,p-xylene	200.0	ppb	-No-	238.2 sec
16	o-xylene	100.0	ppb	-No-	278.9 sec
- Detected 16 peaks. Use + + to scroll. I 405 sec					





TIME PRINTED: MAY 8,95 10:36

SAMPLE TIME: MAY 8,95 10:29

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 32 C
MAX GAIN 1000
ANALYSIS TIME 400.0 SEC

PEAK REPORT

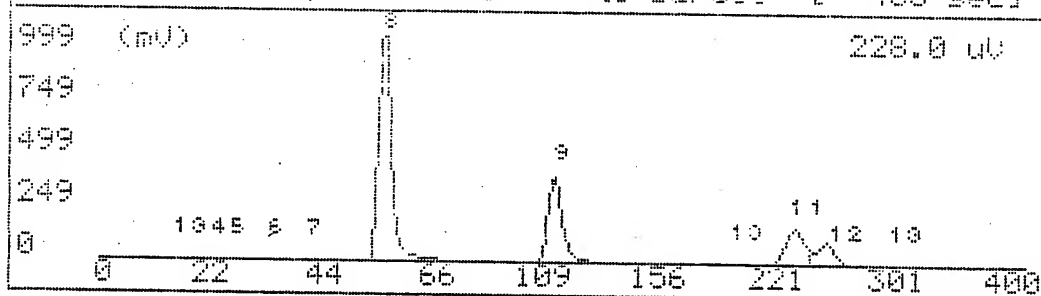
PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.057 MVS	13.8
2	UNKNOWN	11.66 MVS	15.4
3	UNKNOWN	44.28 MVS	17.0
4	UNKNOWN	66.64 MVS	22.1
5	UNKNOWN	0.543 MVS	26.0
6	UNKNOWN	0.962 MVS	33.2
7	UNKNOWN	12.23 MVS	40.8
8	BENZENE	1.492 PPM	53.4
9	TOLUENE	1.648 PPM	106.9
10	UNKNOWN	1.098 MVS	192.2
11	ETHYLBENZENE	1.870 PPM	221.2
12	M,P-XYLENE	3.156 PPM	237.8
13	O-XYLENE	1.683 PPM	279.2

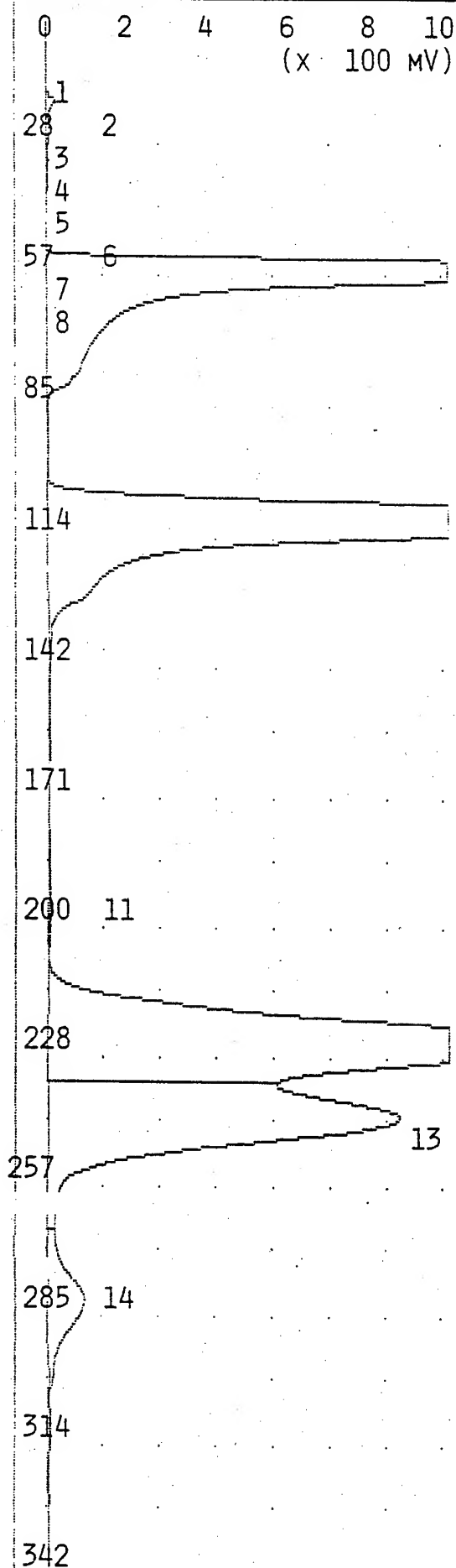
NOTES

DESTROY GREENWAY (TRAINEE)
DULUTH ANGB
1 PPM BTEX

J. BYRD, JR. (OPERATOR)

G.L. Ready		158+ GC Function		Ver. 8.95	10:43
-- Analysis No. 4		-- Run at - Mar 8.95		10:29	-
PK No	Name	Conc./Area	Alarm	Ret. Time	
5	Unknown	0.543 mUS	-No-	26.0	sec
6	Unknown	0.962 mUS	-No-	33.2	sec
7	Unknown	13.81 mUS	-No-	40.0	sec
8	benzene	1.003 ppm	-No-	53.4	sec
9	toluene	1.017 ppm	-No-	106.0	sec
10	Unknown	1.098 mUS	-No-	192.2	sec
11	ethylbenzene	1.007 ppm	-No-	221.2	sec
12	m,p-xylene	2.029 ppm	-No-	237.0	sec
13	o-xylene	1.292 ppm	-No-	279.2	sec
- Detected 13 peaks. Use + + to scroll [405 sec]					





TIME PRINTED: MAY 8,95 10:51

SAMPLE TIME: MAY 8,95 10:45

METHOD

SLOPE UP 0.500 MV/SEC
 SLOPE DOWN 1.500 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 14 ML/MIN
 B/F FLOW 14 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 32 C
 MAX GAIN 1000
 ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.037 MVS	14.0
2	UNKNOWN	8.568 MVS	15.6
3	UNKNOWN	72.20 MVS	17.1
4	UNKNOWN	70.96 MVS	22.2
5	UNKNOWN	0.449 MVS	26.2
6	UNKNOWN	19.37 MVS	33.5
7	UNKNOWN	11.09 MVS	40.6
8	UNKNOWN	3.611 MVS	46.4
9	BENZENE	5.418 PPM	54.2
10	TOLUENE	7.524 PPM	108.2
11	UNKNOWN	5.501 MVS	193.2
12	ETHYLBENZENE	9.005 PPM	223.4
13	M,P-XYLENE	16.83 PPM	239.6
14	O-XYLENE	5.844 PPM	280.8

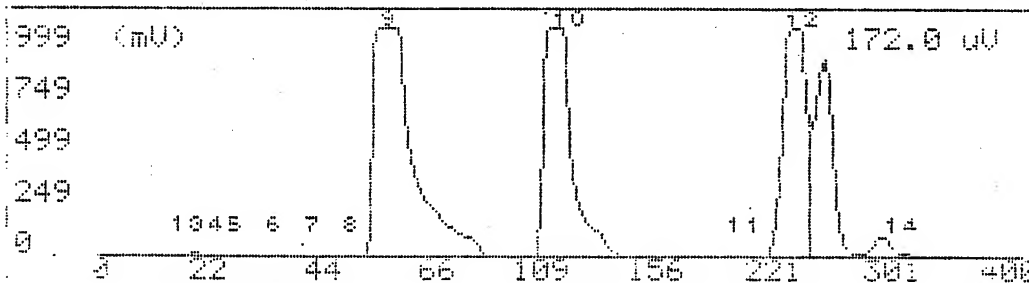
NOTES

DESTRY GREENWAY (TRAINEE)
 DULUTH ANGB
 10 PPM BTEX
 J. BYRD, JR. (OPERATOR)

G.C. Ready 105+ GC Function May 8, 95 10:57
 -- Analysis No 5 -- Run at - May 8, 95 10:45 -

Pk No	Name	Conc/Area	Alarm	Ret. time
6	Unknown	19.40 mUS	-No-	33.5 sec
7	Unknown	11.13 mUS	-No-	40.0 sec
8	Unknown	3.640 mUS	-No-	46.4 sec
9	benzene	10.00 ppm	-No-	54.2 sec
10	toluene	10.00 ppm	-No-	100.2 sec
11	Unknown	5.501 mUS	-No-	193.2 sec
12	ethylbenzene	10.00 ppm	-No-	223.4 sec
13	m,p-xylene	20.00 ppm	-No-	239.6 sec
14	o-xylene	10.02 ppm	-No-	269.0 sec

- Detected 14 peaks. Use + + to scroll [405 sec]



ANALYSIS #8

10S+ GC FUNCTION ANALYSIS REPORT

0 2 4 6 8 10
(x 1000 UV)

TIME PRINTED: MAY 8,95 12:07

SAMPLE TIME: MAY 8,95 12:00

METHOD

SLOPE UP 0.500 MV/SEC

SLOPE DOWN 1.500 MV/SEC

MIN AREA 0.000 MVSEC

MIN HEIGHT 0.000 MV

ANALYSIS DELAY 0.0 SEC

WINDOW PERCENT 10.0 %

DET FLOW 14 ML/MIN

B/F FLOW 14 ML/MIN

AUX FLOW 0 ML/MIN

OVEN TEMP 40 C

AMB TEMP 32 C

MAX GAIN 1000

ANALYSIS TIME 400.0 SEC

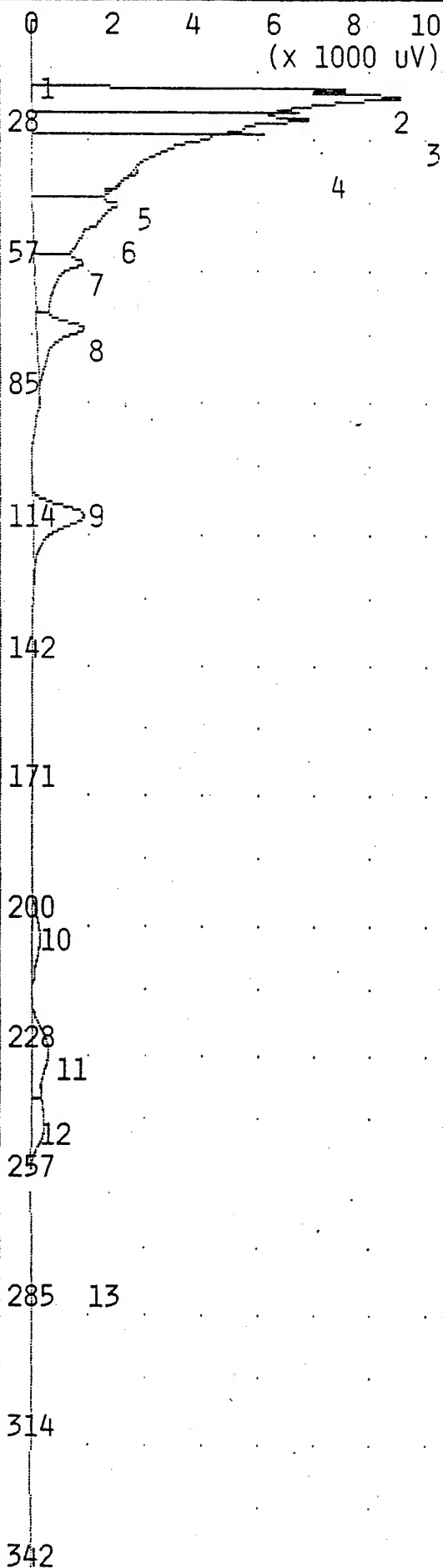
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.076 MVS	14.1
2	UNKNOWN	5.985 MVS	15.6
3	UNKNOWN	23.16 MVS	17.2
4	UNKNOWN	38.31 MVS	22.2
5	UNKNOWN	0.409 MVS	33.8
6	UNKNOWN	8.861 MVS	40.8
7	BENZENE	2.184 PPB	53.2
8	UNKNOWN	4.767 MVS	67.2
9	TOLUENE	8.239 PPB	108.0
10	UNKNOWN	3.575 MVS	125.2
11	UNKNOWN	3.601 MVS	199.0
12	ETHYLBENZENE	7.450 PPB	224.8
13	M,P-XYLENE	12.76 PPB	240.0
14	O-XYLENE	13.91 PPB	276.2

NOTES

DESTRY GREENWAY (TRAINEE)
DULUTH ANGB
AIR BLANK

J. BYRD, JR. (OPERATOR)



TIME PRINTED: MAY 8,95 13:03

SAMPLE TIME: MAY 8,95 12:56

METHOD

SLOPE UP 0.500 MV/SEC
 SLOPE DOWN 1.500 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 14 ML/MIN
 B/F FLOW 14 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 32 C
 MAX GAIN 1000
 ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.090 MVS	14.2
2	UNKNOWN	8.805 MVS	15.7
3	UNKNOWN	38.35 MVS	17.1
4	UNKNOWN	66.22 MVS	22.4
5	UNKNOWN	0.200 MVS	33.8
6	UNKNOWN	18.82 MVS	40.8
7	BENZENE	3.501 PPB	53.6
8	UNKNOWN	7.348 MVS	67.6
9	TOLUENE	5.687 PPB	108.2
10	UNKNOWN	5.390 MVS	201.8
11	ETHYLBENZENE	7.190 PPB	225.8
12	M,P-XYLENE	12.61 PPB	241.0
13	O-XYLENE	10.59 PPB	276.0

NOTES

DESTROY GREENWAY (TRAINEE)
 DULUTH ANG
 026-002MW
 20.0-22.0 10G
 J. BYRD, JR. (OPERATOR)

0 2 4 6 8 10
(X 10 MV)

TIME PRINTED: MAY 8,95 13:13

SAMPLE TIME: MAY 8,95 13:07

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 32 C
MAX GAIN 1000
ANALYSIS TIME 400.0 SEC

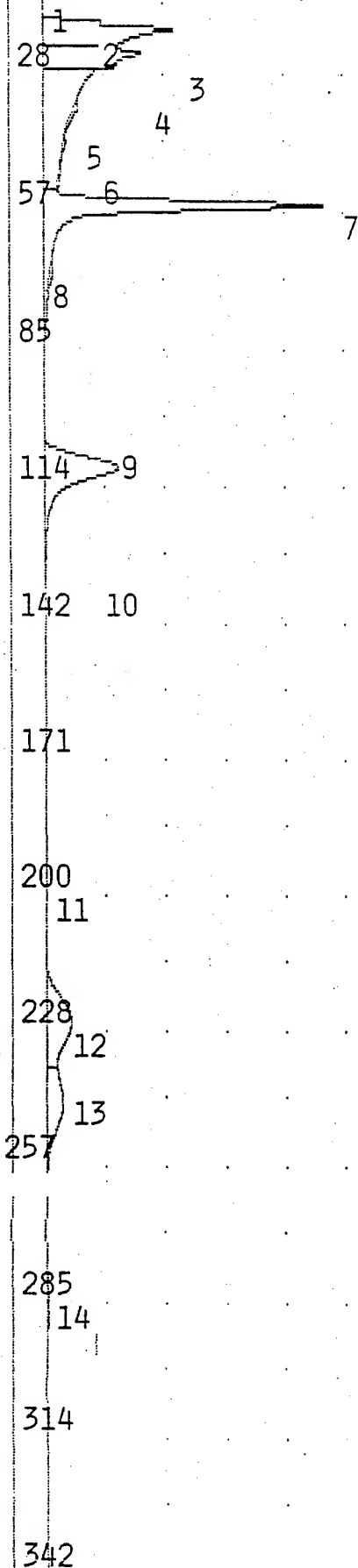
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.073 MVS	14.1
2	UNKNOWN	15.64 MVS	15.7
3	UNKNOWN	113.8 MVS	17.1
4	UNKNOWN	247.1 MVS	22.4
5	UNKNOWN	2.439 MVS	33.8
6	UNKNOWN	3.491 MVS	41.0
7	BENZENE	98.54 PPB	53.7
8	UNKNOWN	1.653 MVS	67.4
9	TOLUENE	80.12 PPB	108.2
10	UNKNOWN	2.313 MVS	134.1
11	UNKNOWN	1.798 MVS	199.6
12	ETHYLBENZENE	71.95 PPB	224.6
13	M,P-XYLENE	132.6 PPB	241.3
14	O-XYLENE	47.18 PPB	282.9

NOTES

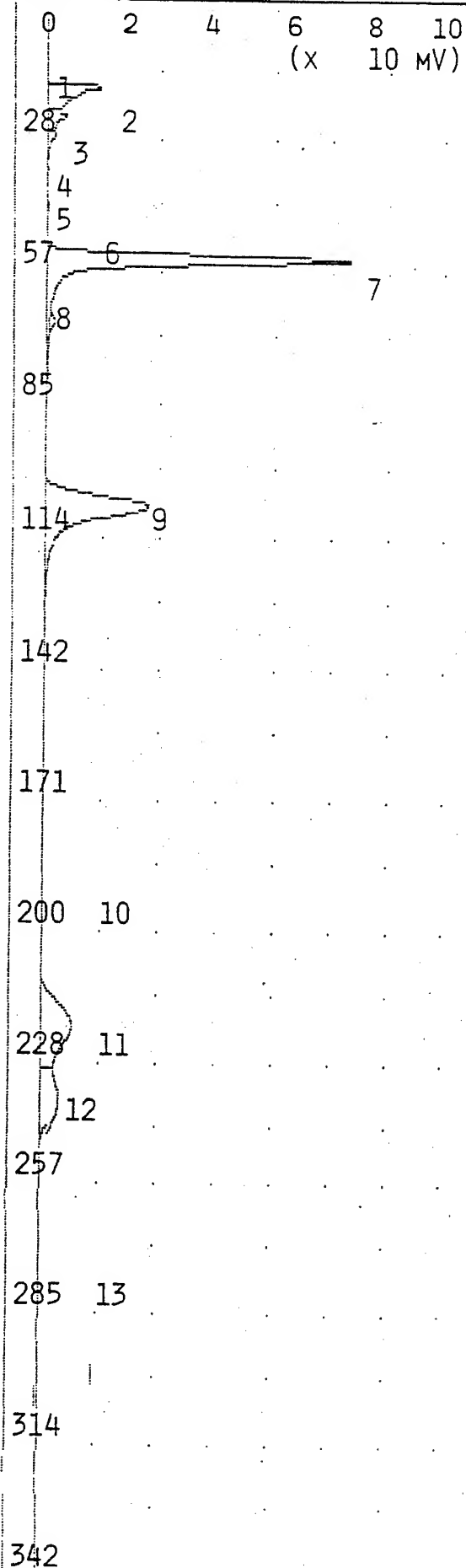
DESTROY GREENWAY (TRAINEE)
DULUTH ANGB
100 PPB BTEX STANDARD

J. BYRD, JR. (OPERATOR)



ANALYSIS #1

10S+ GC FUNCTION ANALYSIS REPORT

TIME PRINTED: MAY 11,95 08:01
SAMPLE TIME: MAY 11,95 07:54

METHOD

SLOPE UP	0.500	MV/SEC
SLOPE DOWN	1.500	MV/SEC
MIN AREA	0.000	MVSEC
MIN HEIGHT	0.000	MV
ANALYSIS DELAY	0.0	SEC
WINDOW PERCENT	10.0	%
DET FLOW	14	ML/MIN
B/F FLOW	14	ML/MIN
AUX FLOW	0	ML/MIN
OVEN TEMP	40	C
AMB TEMP	28	C
MAX GAIN	1000	
ANALYSIS TIME	400.0	SEC

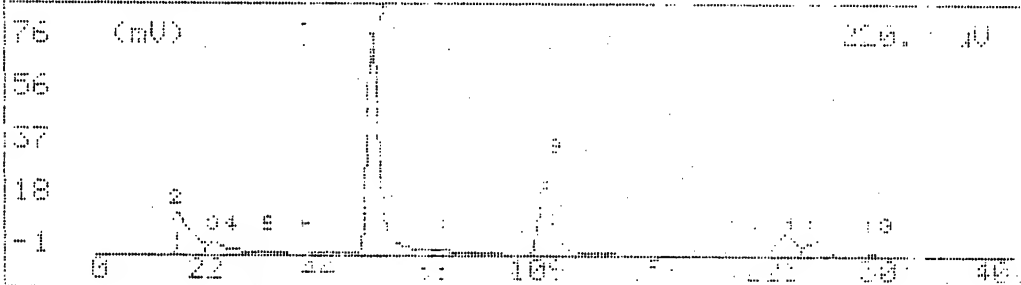
PEAK REPORT

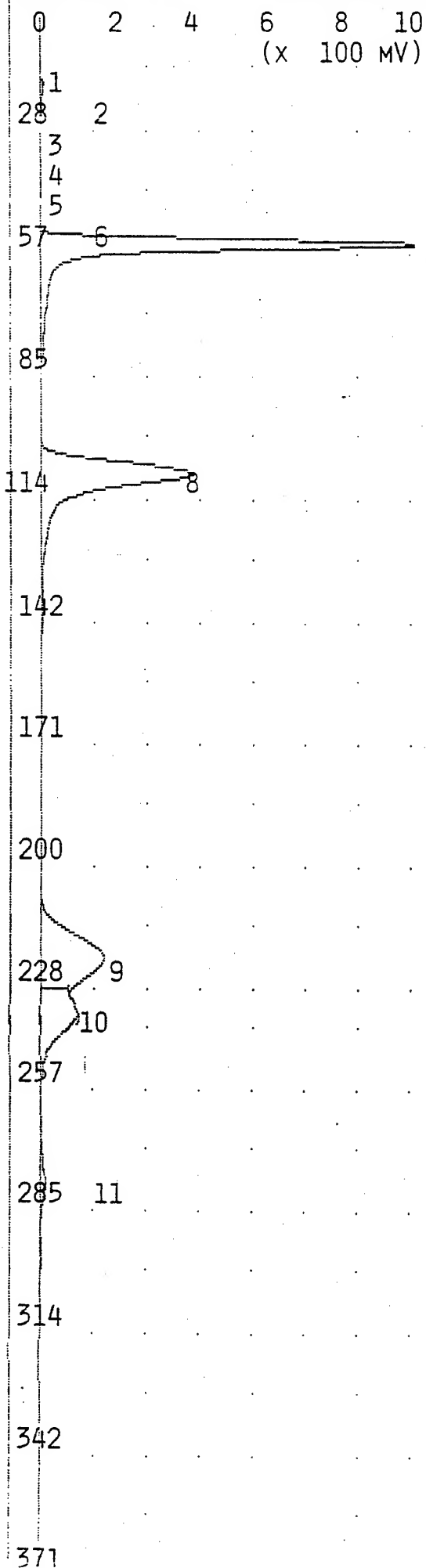
PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.084 MVS	14.0
2	UNKNOWN	47.29 MVS	15.3
3	UNKNOWN	15.14 MVS	21.8
4	UNKNOWN	9.843 MVS	25.9
5	UNKNOWN	3.327 MVS	33.0
6	UNKNOWN	7.071 MVS	41.0
7	UNKNOWN	238.5 MVS	52.4
8	UNKNOWN	3.147 MVS	66.0
9	UNKNOWN	170.2 MVS	105.4
10	UNKNOWN	1.826 MVS	192.2
11	UNKNOWN	104.2 MVS	218.8
12	UNKNOWN	73.10 MVS	234.8
13	UNKNOWN	13.85 MVS	275.4

NOTES

JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX STANDARD

E.C. Ready		100	EL Fraction	1.0	45	10
-- Analysts No			Run At	1.0	57	
PK No	Name	Area	Area	Area	Area	Area
5	Unknown	1.327	0.02		1.7	0.02
6	Unknown	1.271	0.02		1.7	0.02
7	benzene	100.0	0.02		1.7	0.02
8	Unknown	1.147	0.02		1.7	0.02
9	toluene	100.0	0.02		1.7	0.02
10	Unknown	1.327	0.02		1.7	0.02
11	ethylbenzene	100.0	0.02		1.7	0.02
12	m,p-xylene	100.0	0.02		1.7	0.02
13	o-xylene	100.0	0.02		1.7	0.02
- Detected 13 peaks. See + to 1000						





TIME PRINTED: MAY 11,95 08:17

SAMPLE TIME: MAY 11,95 08:10

METHOD

SLOPE UP 0.500 MV/SEC
 SLOPE DOWN 1.500 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 14 ML/MIN
 B/F FLOW 14 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 29 C
 MAX GAIN 1000

ANALYSIS TIME 400.0 SEC

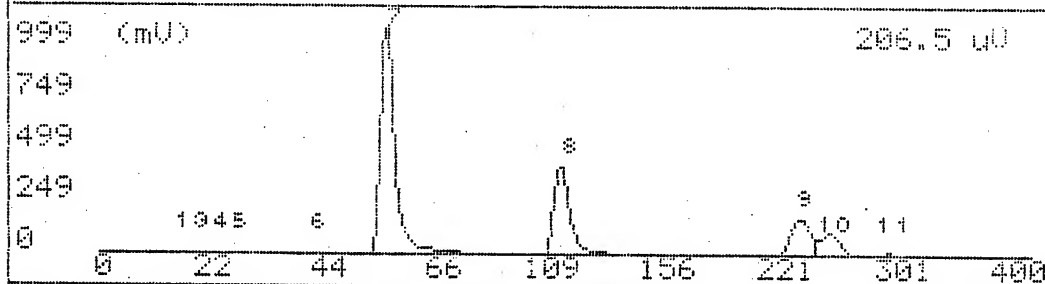
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.092 MVS	14.0
2	UNKNOWN	14.71 MVS	15.3
3	UNKNOWN	34.69 MVS	16.8
4	UNKNOWN	20.17 MVS	21.9
5	UNKNOWN	19.19 MVS	25.8
6	UNKNOWN	7.857 MVS	41.0
7	BENZENE	1.579 PPM	52.9
8	TOLUENE	1.844 PPM	106.2
9	ETHYLBENZENE	2.122 PPM	219.6
10	M,P-XYLENE	3.912 PPM	235.6
11	O-XYLENE	2.662 PPM	276.5

NOTES

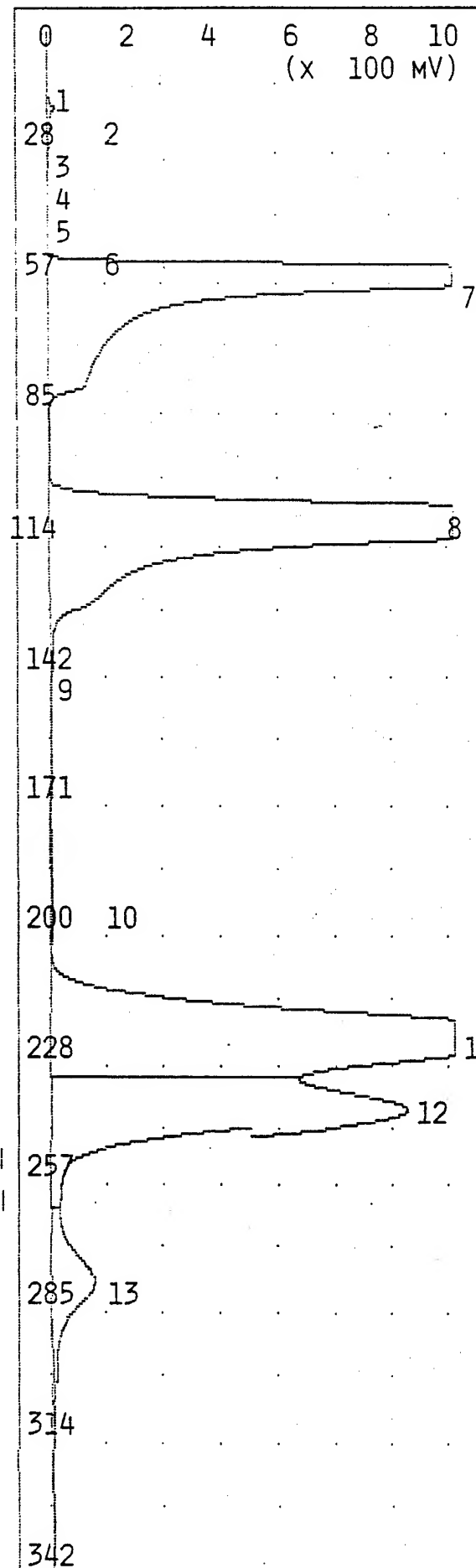
JOE BYRD, JR.
 DULUTH ANGB
 1 PPM BTEX STANDARD

G.C. Ready 165+ GC Function May 11 95 08:22					
-- Analysis No 2 -- Run at -- May 11 95 08:19 --					
Pk No	Name	Conc	Area	Alarm	Ret. Time
3	Unknown	34.119	mUS	-No-	16.00 sec
4	Unknown	26.117	mUS	-No-	21.00 sec
5	Unknown	19.112	mUS	-No-	25.00 sec
6	Unknown	7.100	mUS	-No-	41.00 sec
7	benzene	1.000	ppm	-No-	52.00 sec
8	toluene	1.000	ppm	-No-	106.22 sec
9	ethylbenzene	1.000	ppm	-No-	219.00 sec
10	m,p-xylene	2.000	ppm	-No-	245.00 sec
11	o-xylene	1.000	ppm	-No-	271.00 sec
- Detected 11 peaks. Use + + to scroll [465 sec]					



ANALYSIS #3

10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 11,95 08:31

SAMPLE TIME: MAY 11,95 08:24

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 29 C
MAX GAIN 1000
ANALYSIS TIME 400.0 SEC

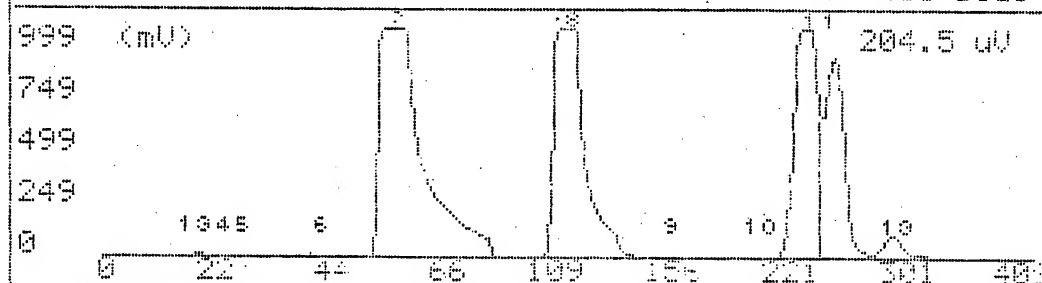
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.109 MVS	13.8
2	UNKNOWN	12.12 MVS	15.2
3	UNKNOWN	62.90 MVS	16.8
4	UNKNOWN	27.77 MVS	21.9
5	UNKNOWN	37.16 MVS	25.8
6	UNKNOWN	9.167 MVS	40.5
7	BENZENE	5.231 PPM	53.7
8	TOLUENE	6.822 PPM	107.0
9	UNKNOWN	68.48 MVS	142.9
10	UNKNOWN	8.051 MVS	189.4
11	ETHYLBENZENE	8.435 PPM	220.4
12	M,P-XYLENE	15.70 PPM	236.4
13	O-XYLENE	5.318 PPM	276.8

NOTES

JOE BYRD, JR.
DULUTH ANGB
10 PPM BTEX STANDAR

G.C. Ready		105+ GC Function		May 11.95	08:36
-- Analysis No 3		-- Run at --		May 11.95	08:24
Pk No	Name	Conc/Area	Alarm	Ret. Time	
5	Unknown	37.16 mUS	-No-	25.8	sec
6	Unknown	9.167 mUS	-No-	40.0	sec
7	benzene	10.00 ppm	-No-	50.7	sec
8	toluene	10.00 ppm	-No-	107.0	sec
9	Unknown	68.48 mUS	-No-	142.9	sec
10	Unknown	8.051 mUS	-No-	189.4	sec
11	ethylbenzene	10.00 ppm	-No-	220.4	sec
12	m,p-xylene	20.00 ppm	-No-	236.4	sec
13	o-xylene	10.02 ppm	-No-	276.8	sec
- Detected 13 peaks. Use + + to scroll					[405 sec]



0 2 4 6 8 10
(x 1000 UV)

TIME PRINTED: MAY 11,95 08:43

SAMPLE TIME: MAY 11,95 08:37

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 30 C
MAX GAIN 1000
ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.109 MVS	13.8
2	UNKNOWN	6.790 MVS	15.4
3	UNKNOWN	75.27 MVS	16.9
4	UNKNOWN	0.583 MVS	21.7
5	UNKNOWN	1.864 MVS	41.6
6	BENZENE	8.416 PPB	52.5
7	UNKNOWN	31.31 MVS	66.4
8	TOLUENE	17.84 PPB	106.2
9	UNKNOWN	1.272 MVS	131.0
10	ETHYLBENZENE	21.50 PPB	220.6
11	M,P-XYLENE	51.14 PPB	236.6
12	O-XYLENE	21.45 PPB	276.8

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK

1
28
57
85
114
142
171
200
228
257
285
314
342
371

0 4 8 12 16 20
(x 1000 UV)

TIME PRINTED: MAY 11,95 08:54

SAMPLE TIME: MAY 11,95 08:47

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 30 C
MAX GAIN 1000
ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.065 MVS	13.8
2	UNKNOWN	18.17 MVS	15.6
3	UNKNOWN	128.6 MVS	17.1
4	UNKNOWN	0.478 MVS	22.0
5	UNKNOWN	1.634 MVS	40.9
6	BENZENE	5.813 PPB	52.8
7	UNKNOWN	14.78 MVS	66.4
8	TOLUENE	6.031 PPB	106.5
9	UNKNOWN	0.885 MVS	147.2
10	UNKNOWN	0.988 MVS	196.2
11	ETHYLBENZENE	8.347 PPB	220.2
12	M,P-XYLENE	18.19 PPB	235.2

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-001MW
0.5- 2.5 10G

0 4 8 12 16 20
(x 1000 UV)

TIME PRINTED: MAY 11, 95 09:04

SAMPLE TIME: MAY 11, 95 08:57

METHOD

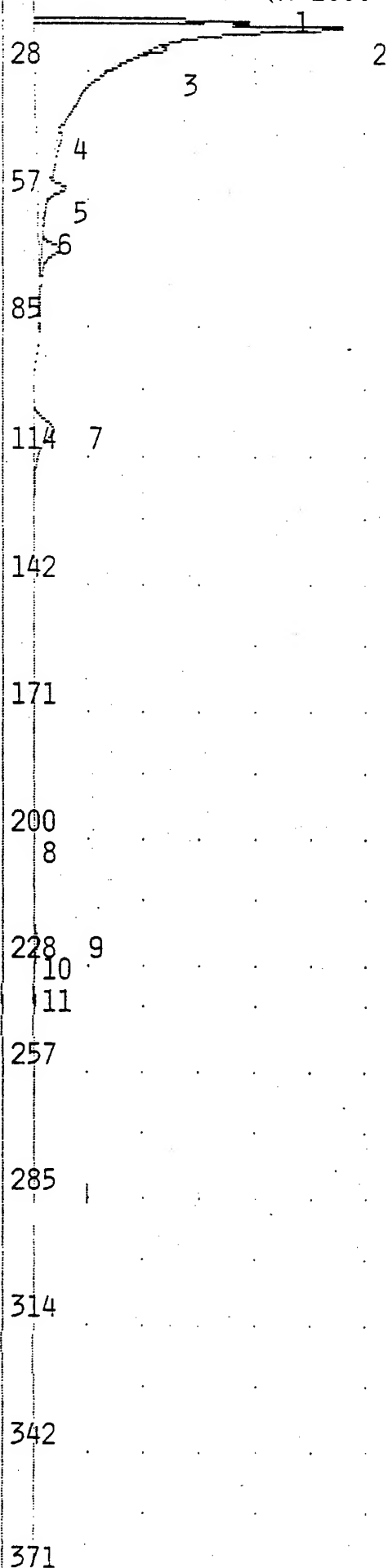
SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 30 C
MAX GAIN 1000
ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	13.02 MVS	15.4
2	UNKNOWN	142.8 MVS	17.0
3	UNKNOWN	0.893 MVS	21.9
4	UNKNOWN	1.472 MVS	40.9
5	BENZENE	0.867 PPB	52.8
6	UNKNOWN	3.967 MVS	66.6
7	TOLUENE	3.873 PPB	106.6
8	UNKNOWN	7.840 MVS	197.8
9	UNKNOWN	2.642 MVS	216.8
10	ETHYLBENZENE	8.407 PPB	220.2
11	M,P-XYLENE	20.59 PPB	237.8

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-001MW
5.0- 7.0 10G



0 4 8 12 16 20
(x 1000 UV)

TIME PRINTED: MAY 11,95 09:14

SAMPLE TIME: MAY 11,95 09:07

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 30 C
MAX GAIN 1000
ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.549 MVS	13.9
2	UNKNOWN	16.42 MVS	15.3
3	UNKNOWN	42.95 MVS	16.8
4	UNKNOWN	54.88 MVS	21.8
5	UNKNOWN	10.85 MVS	40.8
6	BENZENE	2.496 PPB	52.9
7	UNKNOWN	6.488 MVS	66.5
8	TOLUENE	3.826 PPB	106.8
9	UNKNOWN	20.58 MVS	198.8
10	ETHYLBENZENE	13.00 PPB	221.2
11	M,P-XYLENE	19.44 PPB	237.2

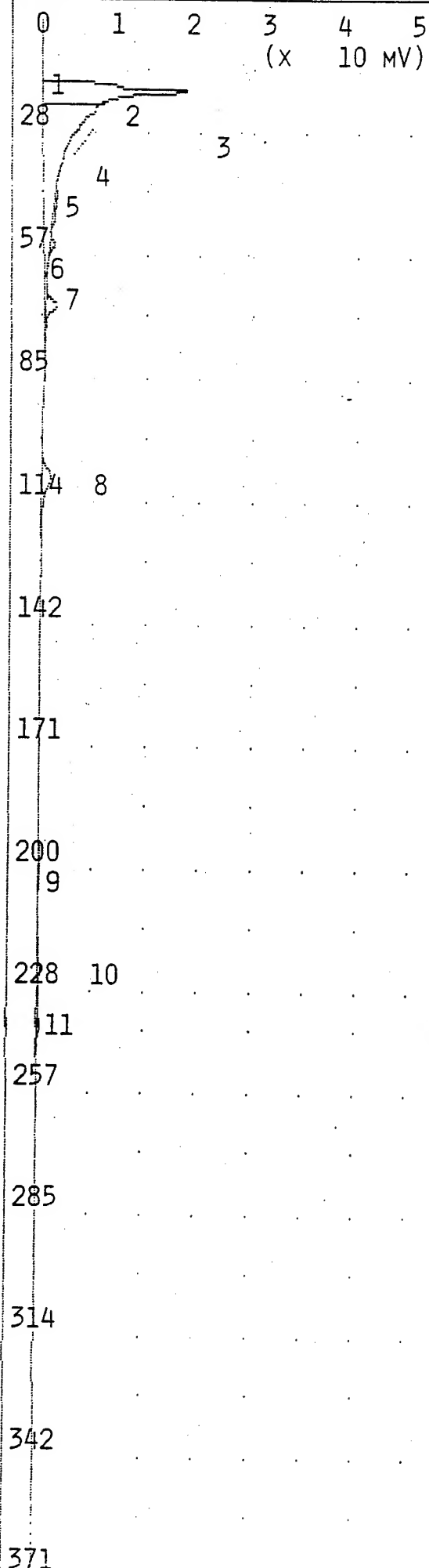
NOTES

JOE BYRD, JR.

DULUTH ANGB

025-001MW

10.0-12.0 10G



TIME PRINTED: MAY 11,95 09:24

SAMPLE TIME: MAY 11,95 09:17

METHOD

SLOPE UP 0.500 MV/SEC
 SLOPE DOWN 1.500 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 14 ML/MIN
 B/F FLOW 14 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 30 C
 MAX GAIN 1000
 ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.023 MVS	13.6
2	UNKNOWN	10.91 MVS	15.4
3	UNKNOWN	163.0 MVS	16.9
4	UNKNOWN	0.510 MVS	21.8
5	UNKNOWN	1.974 MVS	41.0
6	BENZENE	0.538 PPB	52.6
7	UNKNOWN	5.595 MVS	66.5
8	TOLUENE	4.293 PPB	106.8
9	UNKNOWN	1.612 MVS	198.4
10	ETHYLBENZENE	3.302 PPB	222.4
11	M,P-XYLENE	10.60 PPB	237.0

NOTES

JOE BYRD, JR.
 DULUTH ANGB
 025-001MW
 15.0-17.0 10G

0 1 2 3 4 5
(X 10 MV)

TIME PRINTED: MAY 11,95 09:34

SAMPLE TIME: MAY 11,95 09:28

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000
ANALYSIS TIME 400.0 SEC

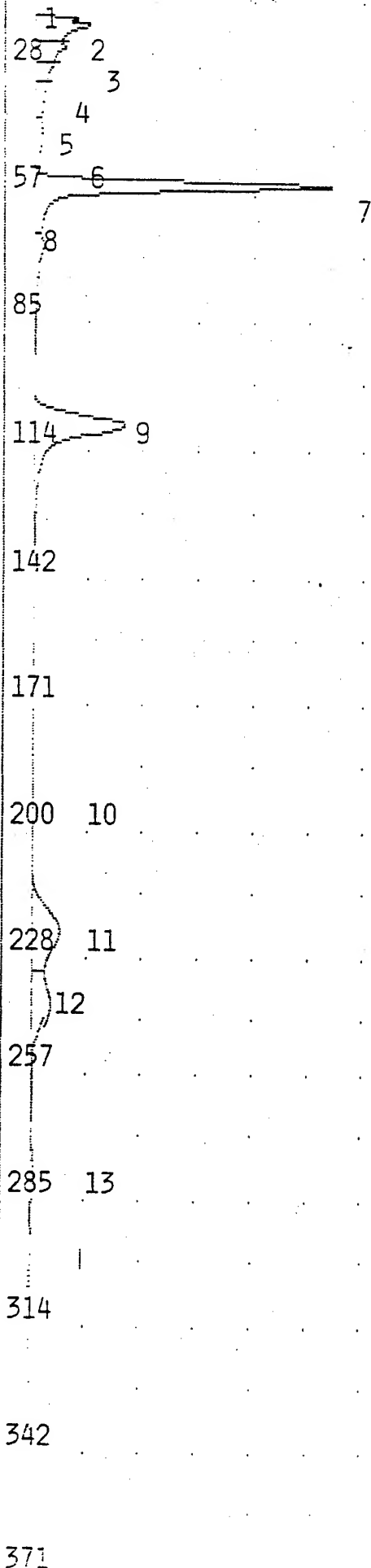
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	11.31 MVS	15.4
2	UNKNOWN	230.9 MVS	16.8
3	UNKNOWN	1.058 MVS	21.8
4	UNKNOWN	0.781 MVS	40.8
5	BENZENE	0.853 PPB	52.8
6	UNKNOWN	4.015 MVS	66.4
7	TOLUENE	3.931 PPB	106.9
8	UNKNOWN	0.980 MVS	199.2
9	ETHYLBENZENE	2.896 PPB	222.2
10	M,P-XYLENE	8.366 PPB	237.2

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-001MW
20.0-22.0 10G

0 2 4 6 8 10
(X 10 MV)



TIME PRINTED: MAY 11,95 09:44

SAMPLE TIME: MAY 11,95 09:38

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000
ANALYSIS TIME 400.0 SEC

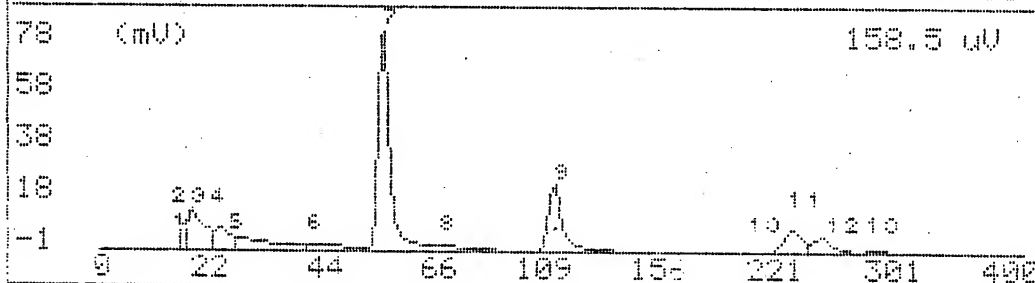
PEAK REPORT

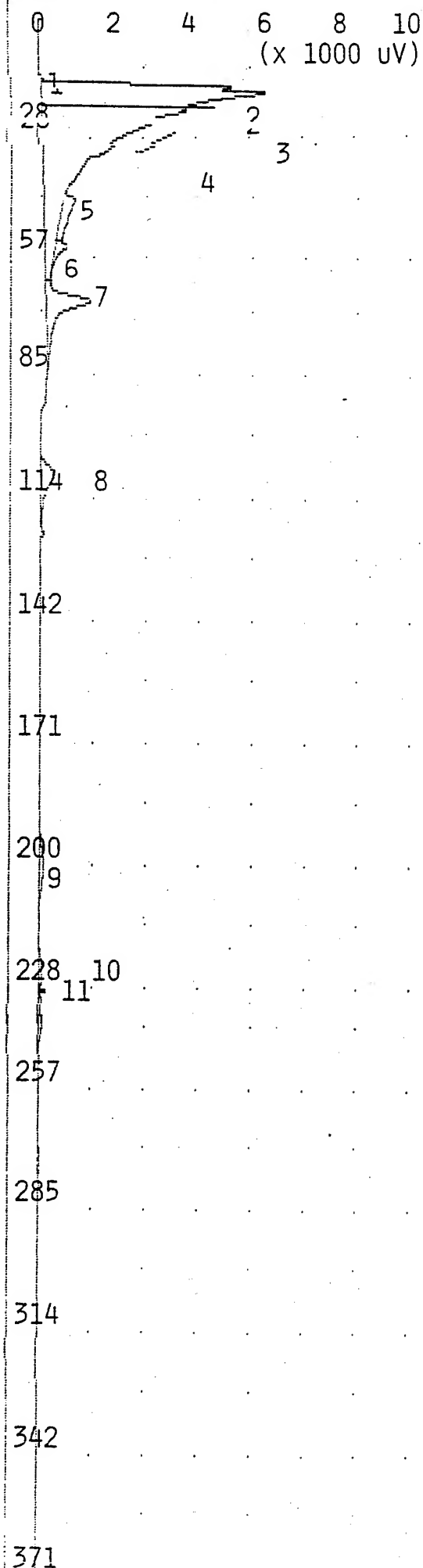
PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.058 MVS	13.7
2	UNKNOWN	12.61 MVS	15.5
3	UNKNOWN	49.87 MVS	17.0
4	UNKNOWN	28.65 MVS	22.1
5	UNKNOWN	40.87 MVS	26.0
6	UNKNOWN	18.72 MVS	40.7
7	BENZENE	90.56 PPB	53.0
8	UNKNOWN	25.81 MVS	66.6
9	TOLUENE	87.03 PPB	106.5
10	UNKNOWN	1.235 MVS	195.0
11	ETHYLBENZENE	89.03 PPB	220.8
12	M,P-XYLENE	193.3 PPB	237.2
13	O-XYLENE	86.62 PPB	278.4

NOTES

JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX

a.C. Ready 135+ 30 Function Ret: 11.95 09:49
 -- Analysis No 10 -- Run at -- Ret: 11.95 09:50 --
 Pk No: Name Conc: Area Alarm Ret: Time
 5 Unknown 40.87 mV3 -No- 26.0 sec
 6 Unknown 10.72 mV3 -No- 40.7 sec
 7 Benzene 99.99 ppb -No- 50.0 sec
 8 Unknown 25.81 mV3 -No- 66.0 sec
 9 toluene 100.0 ppb -No- 100.0 sec
 10 Unknown 1.235 mV3 -No- 100.0 sec
 11 ethylbenzene 99.99 ppb -No- 200.0 sec
 12 m,p-xylene 200.0 ppb -No- 207.2 sec
 13 o-xylene 100.0 ppb -No- 276.4 sec
 - Detected 13 peaks. Use + + to scroll. [405 sec]





TIME PRINTED: MAY 11,95 09:57

SAMPLE TIME: MAY 11,95 09:50

METHOD

SLOPE UP 0.500 MV/SEC
 SLOPE DOWN 1.500 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 14 ML/MIN
 B/F FLOW 14 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 31 C
 MAX GAIN 1000
 ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.279 MVS	14.0
2	UNKNOWN	5.590 MVS	15.5
3	UNKNOWN	68.33 MVS	16.9
4	UNKNOWN	0.416 MVS	21.8
5	UNKNOWN	2.456 MVS	41.4
6	BENZENE	0.367 PPB	52.4
7	UNKNOWN	6.480 MVS	66.6
8	TOLUENE	1.803 PPB	106.9
9	UNKNOWN	4.480 MVS	198.6
10	ETHYLBENZENE	2.298 PPB	220.6
11	UNKNOWN	4.276 MVS	227.2

NOTES

JOE BYRD, JR.
DULUTH ANG

~~100 PPB BTEX~~ 53
AIR BLANK

ANALYSIS #12 10S+ GC FUNCTION ANALYSIS REPORT

0 4 8 12 16 20
(x 1000 UV)

TIME PRINTED: MAY 11, 95 10:08

SAMPLE TIME: MAY 11, 95 10:02

METHOD

SLOPE UP 0.500 MV/SEC

SLOPE DOWN 1.500 MV/SEC

MIN AREA 0.000 MVSEC

MIN HEIGHT 0.000 MV

ANALYSIS DELAY 0.0 SEC

WINDOW PERCENT 10.0 %

DET FLOW 14 ML/MIN

B/F FLOW 14 ML/MIN

AUX FLOW 0 ML/MIN

OVEN TEMP 40 C

AMB TEMP 31 C

MAX GAIN 1000

ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.038 MVS	13.6
2	UNKNOWN	16.49 MVS	15.5
3	UNKNOWN	101.0 MVS	16.8
4	UNKNOWN	0.359 MVS	21.8
5	UNKNOWN	13.46 MVS	40.9
6	BENZENE	2.862 PPB	52.8
7	UNKNOWN	6.725 MVS	66.9
8	TOLUENE	3.946 PPB	106.9
9	UNKNOWN	2.595 MVS	198.8
10	ETHYLBENZENE	1.967 PPB	223.2
11	M,P-XYLENE	4.725 PPB	238.2

NOTES

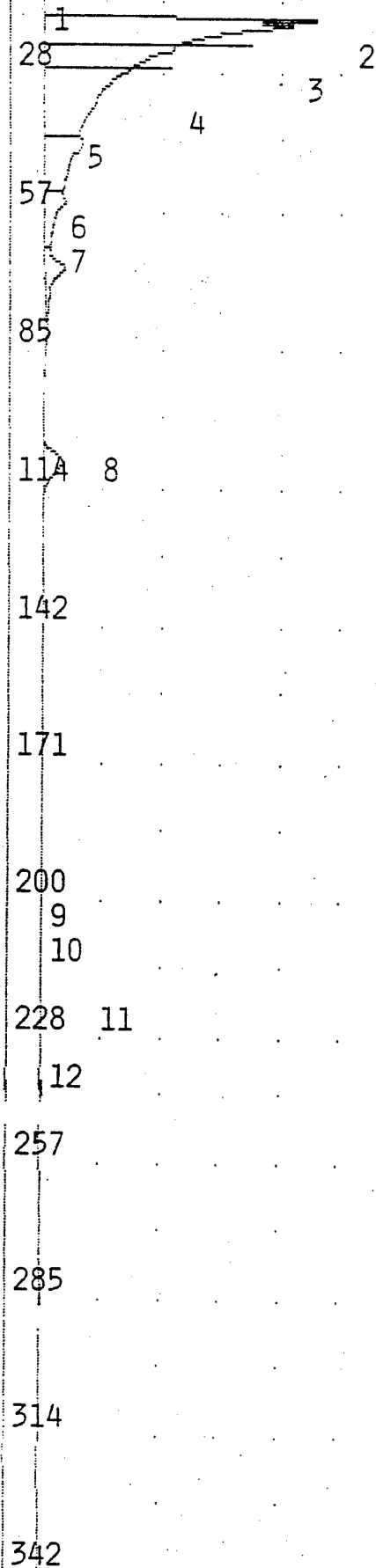
JOE BYRD, JR.

DULUTH ANG

025-001Mw

25.0-27.0 10G

0 4 8 12 16 20
(x 1000 UV)



TIME PRINTED: MAY 11, 95 10:19

SAMPLE TIME: MAY 11, 95 10:12

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000
ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.033 MVS	13.7
2	UNKNOWN	15.19 MVS	15.5
3	UNKNOWN	44.66 MVS	16.9
4	UNKNOWN	61.80 MVS	21.9
5	UNKNOWN	15.08 MVS	40.7
6	BENZENE	2.966 PPB	52.5
7	UNKNOWN	5.615 MVS	66.6
8	TOLUENE	4.089 PPB	106.6
9	UNKNOWN	3.376 MVS	198.4
10	UNKNOWN	4.178 MVS	201.6
11	ETHYLBENZENE	4.732 PPB	223.4
12	M,P-XYLENE	8.636 PPB	236.8

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-001MW
30.0-32.0 10G

ANALYTIC #14 10S+ GC FUNCTION ANALYSIS REPORT

0 4 8 12 16 20
(x 1000 UV)

TIME PRINTED: MAY 11,95 10:29

SAMPLE TIME: MAY 11,95 10:22

METHOD

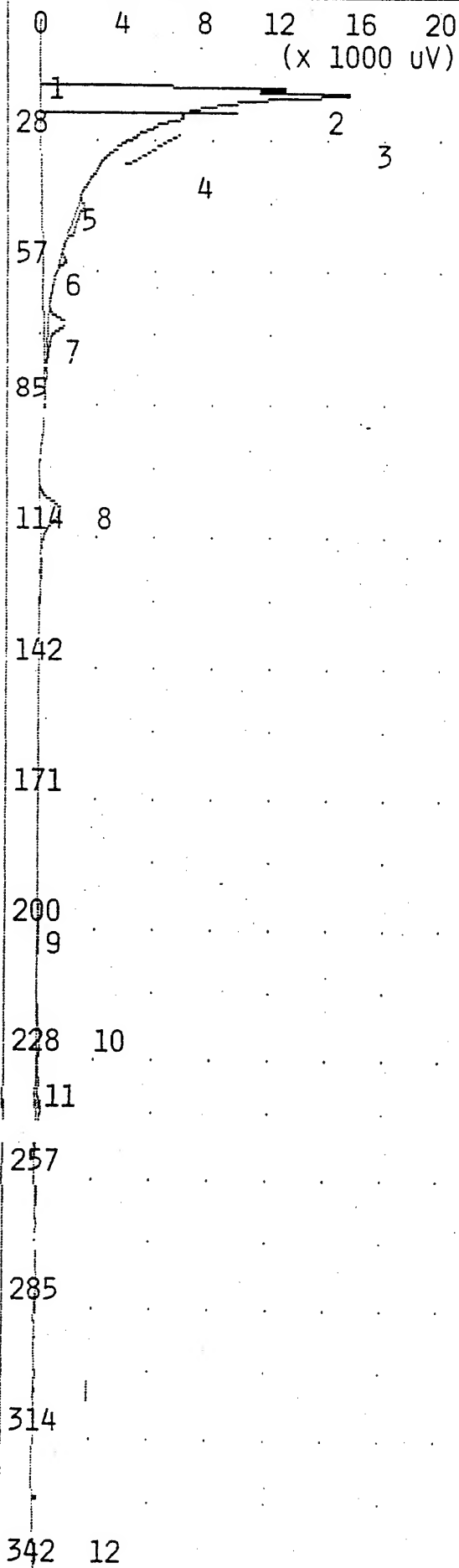
SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000
ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	13.95 MVS	15.5
2	UNKNOWN	164.0 MVS	17.0
3	UNKNOWN	0.404 MVS	22.0
4	UNKNOWN	1.981 MVS	40.8
5	BENZENE	0.211 PPB	52.8
6	UNKNOWN	3.515 MVS	66.8
7	TOLUENE	3.644 PPB	106.8
8	UNKNOWN	7.567 MVS	197.0
9	ETHYLBENZENE	17.75 PPB	222.0
10	M,P-XYLENE	29.24 PPB	238.4

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-001MW
35.0-37.0 10G



TIME PRINTED: MAY 11,95 10:39

SAMPLE TIME: MAY 11,95 10:32

METHOD

SLOPE UP 0.500 MV/SEC
 SLOPE DOWN 1.500 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 14 ML/MIN
 B/F FLOW 14 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 31 C
 MAX GAIN 1000
 ANALYSIS TIME 400.0 SEC

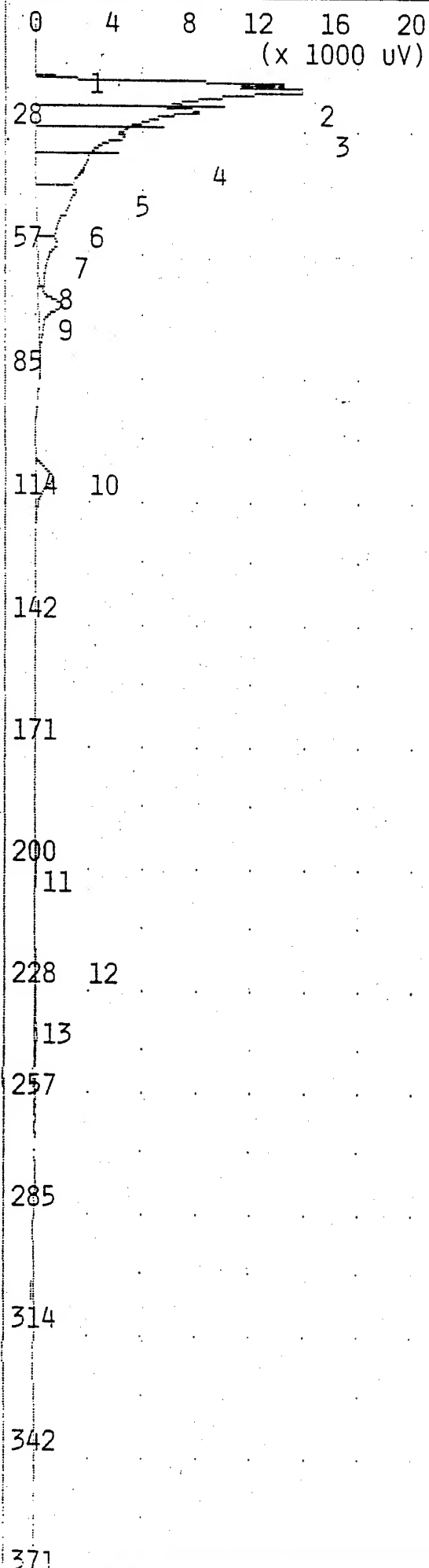
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.037 MVS	13.6
2	UNKNOWN	13.23 MVS	15.5
3	UNKNOWN	153.8 MVS	17.0
4	UNKNOWN	0.479 MVS	22.0
5	UNKNOWN	1.531 MVS	40.8
6	BENZENE	0.007 PPB	53.0
7	UNKNOWN	3.143 MVS	66.8
8	TOLUENE	4.295 PPB	107.2
9	UNKNOWN	1.512 MVS	198.8
10	ETHYLBENZENE	1.673 PPB	223.2
11	M,P-XYLENE	7.019 PPB	236.4
12	UNKNOWN	0.276 MVS	334.6

NOTES

JOE BYRD, JR.
 DULUTH ANGB
 025-002MW
 0.5- 2.5 10g

ANALYTIC #16 10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 11, 95 10:49

SAMPLE TIME: MAY 11, 95 10:42

METHOD

SLOPE UP 0.500 MV/SEC
 SLOPE DOWN 1.500 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 14 ML/MIN
 B/F FLOW 14 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 32 C
 MAX GAIN 1000
 ANALYSIS TIME 400.0 SEC

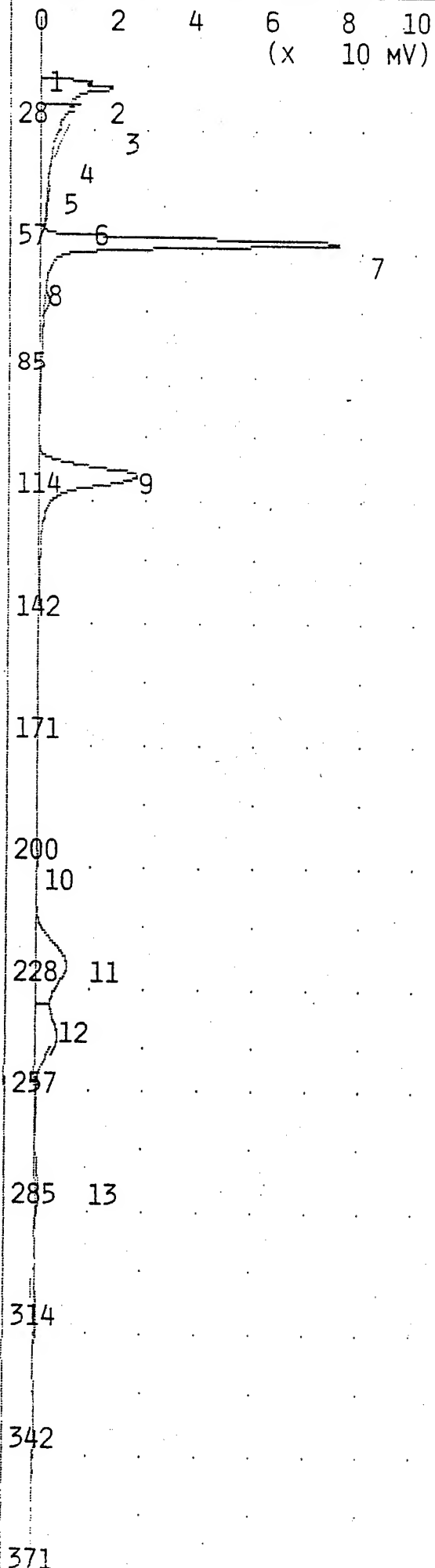
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	2.050 MVS	14.2
2	UNKNOWN	16.34 MVS	15.4
3	UNKNOWN	51.06 MVS	17.2
4	UNKNOWN	38.17 MVS	22.0
5	UNKNOWN	37.86 MVS	27.8
6	UNKNOWN	0.233 MVS	35.2
7	UNKNOWN	18.12 MVS	40.6
8	BENZENE	3.339 PPB	52.5
9	UNKNOWN	7.733 MVS	66.5
10	TOLUENE	4.013 PPB	106.6
11	UNKNOWN	1.393 MVS	196.4
12	ETHYLBENZENE	1.147 PPB	220.2
13	M,P-XYLENE	2.739 PPB	234.4

NOTES

JOE BYRD, JR.
 DULUTH ANGB
 025-002MW
 5.0- 7.0 10s

ANALYTIC #17 10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 11,95 10:59

SAMPLE TIME: MAY 11,95 10:52

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 32 C
MAX GAIN 1000
ANALYSIS TIME 400.0 SEC

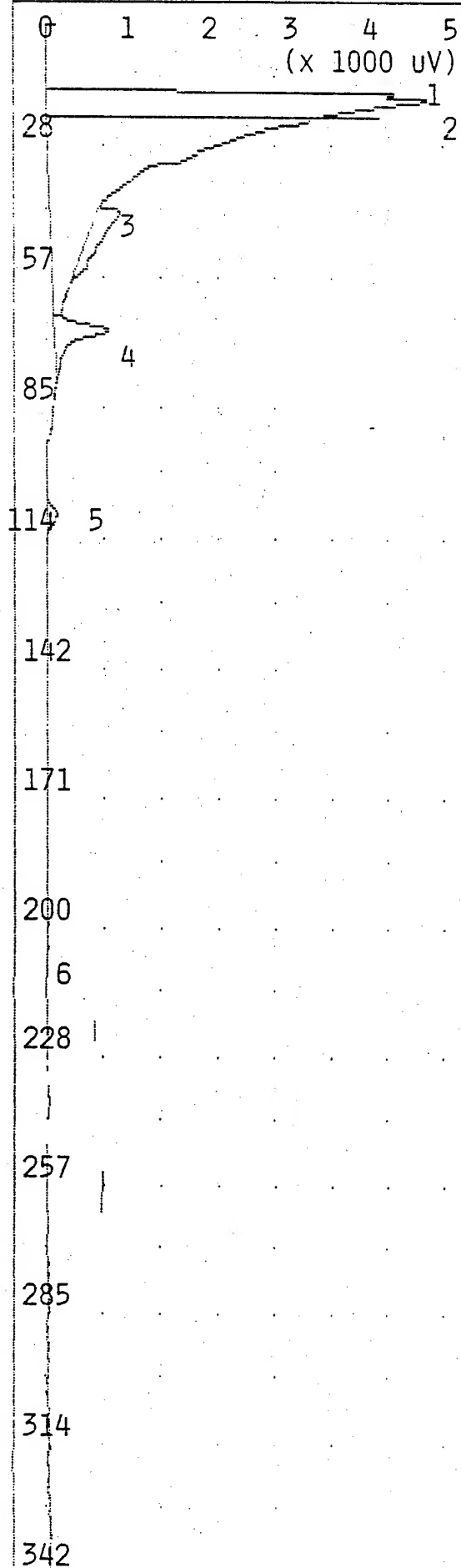
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.042 MVS	13.9
2	UNKNOWN	15.78 MVS	15.4
3	UNKNOWN	153.1 MVS	16.9
4	UNKNOWN	3.226 MVS	22.0
5	UNKNOWN	0.753 MVS	26.0
6	UNKNOWN	2.630 MVS	40.6
7	BENZENE	107.6 PPB	52.9
8	UNKNOWN	4.014 MVS	66.1
9	TOLUENE	103.7 PPB	106.5
10	UNKNOWN	1.214 MVS	195.4
11	ETHYLBENZENE	103.7 PPB	221.4
12	M,P-XYLENE	212.2 PPB	237.6
13	O-XYLENE	108.1 PPB	279.7

NOTES

JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX

ANALYSIS #18 1QS+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 11,95 12:33

SAMPLE TIME: MAY 11,95 12:26

METHOD

SLOPE UP 0.500 MV/SEC

SLOPE DOWN 1.500 MV/SEC

MIN AREA 0.000 MVSEC

MIN HEIGHT 0.000 MV

ANALYSIS DELAY 0.0 SEC

WINDOW PERCENT 10.0 %

DET FLOW 14 ML/MIN

B/F FLOW 14 ML/MIN

AUX FLOW 0 ML/MIN

OVEN TEMP 40 C

AMB TEMP 31 C

MAX GAIN 1000

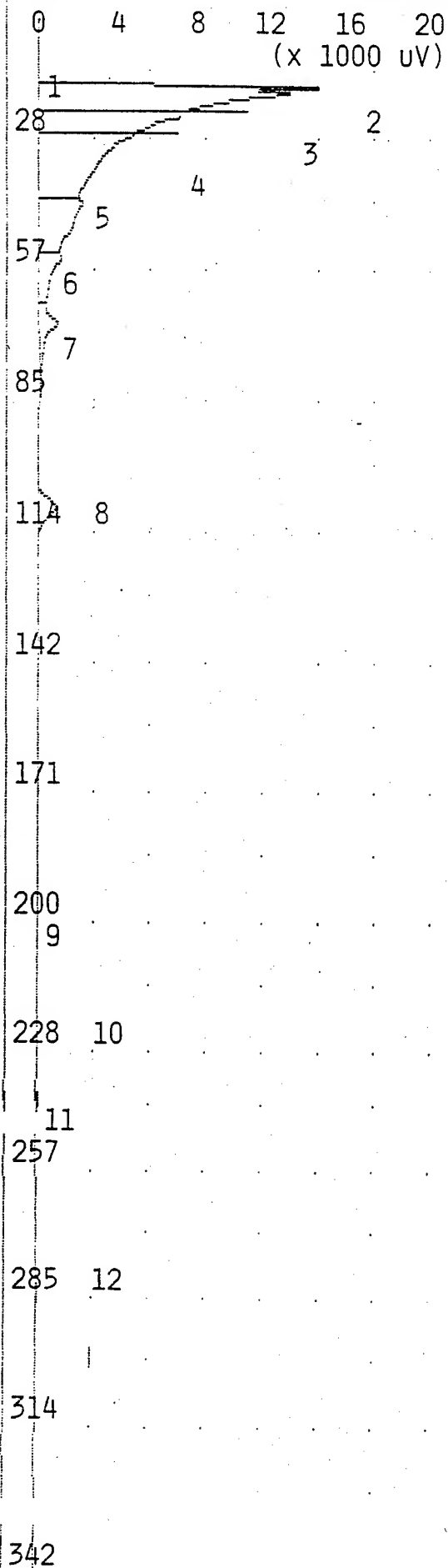
ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	4.790 MVS	15.6
2	UNKNOWN	62.29 MVS	17.0
3	UNKNOWN	2.728 MVS	40.8
4	UNKNOWN	3.254 MVS	66.8
5	TOLUENE	0.924 PPB	107.3
6	ETHYLBENZENE	0.653 PPB	202.6

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK



TIME PRINTED: MAY 11, 95 12:48

SAMPLE TIME: MAY 11, 95 12:41

METHOD

SLOPE UP 0.500 MV/SEC
 SLOPE DOWN 1.500 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 14 ML/MIN
 B/F FLOW 14 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 31 C
 MAX GAIN 1000
 ANALYSIS TIME 400.0 SEC

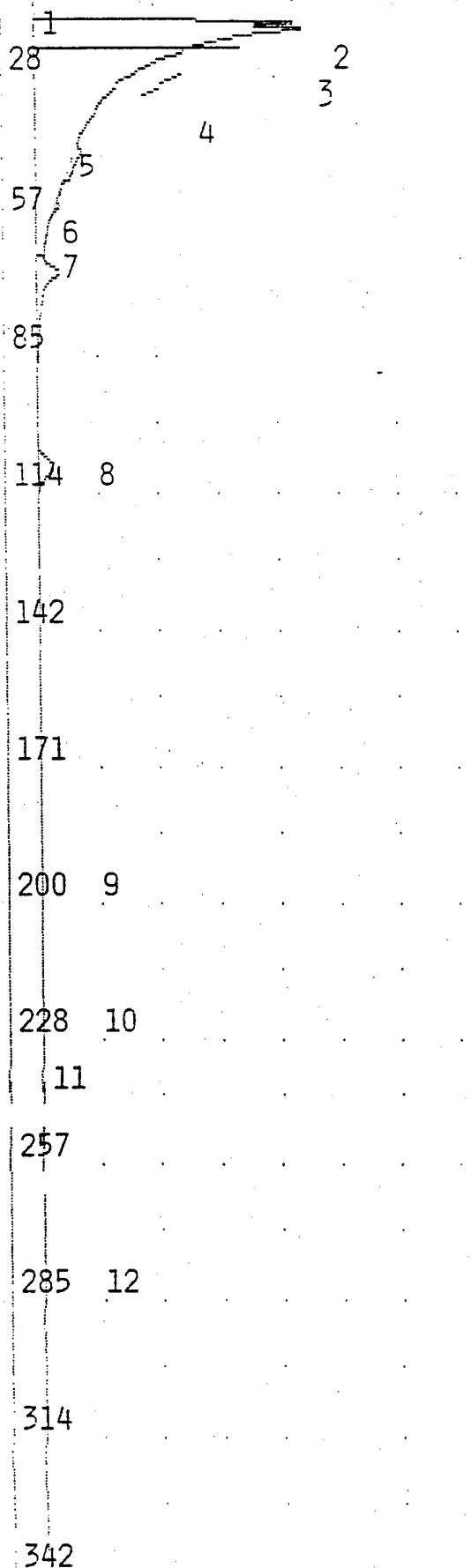
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.020 MVS	14.0
2	UNKNOWN	15.82 MVS	15.6
3	UNKNOWN	51.09 MVS	17.0
4	UNKNOWN	72.26 MVS	22.0
5	UNKNOWN	20.40 MVS	40.8
6	BENZENE	3.548 PPB	53.1
7	UNKNOWN	6.041 MVS	67.2
8	TOLUENE	4.294 PPB	107.2
9	UNKNOWN	1.462 MVS	200.4
10	ETHYLBENZENE	1.859 PPB	223.4
11	M,P-XYLENE	7.298 PPB	238.4
12	O-XYLENE	3.791 PPB	275.4

NOTES

JOE BYRD, JR.
 DULUTH ANGB
 025-002MW
 025-002MW
 10.0-12.0 10G

0 4 8 12 16 20
(x 1000 UV)



TIME PRINTED: MAY 11,95 12:59
SAMPLE TIME: MAY 11,95 12:52

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000
ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.015 MVS	13.6
2	UNKNOWN	14.80 MVS	15.4
3	UNKNOWN	147.3 MVS	16.8
4	UNKNOWN	0.221 MVS	21.8
5	UNKNOWN	1.845 MVS	41.1
6	BENZENE	0.130 PPB	52.9
7	UNKNOWN	6.636 MVS	66.6
8	TOLUENE	3.593 PPB	106.9
9	UNKNOWN	1.148 MVS	194.4
10	ETHYLBENZENE	0.972 PPB	223.4
11	M,P-XYLENE	4.297 PPB	236.4
12	O-XYLENE	3.309 PPB	274.6

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-002MW
15.0-17.0 10G

0 2 4 6 8 10
(x 10 MV)

TIME PRINTED: MAY 11,95 14:14

SAMPLE TIME: MAY 11,95 14:07

METHOD

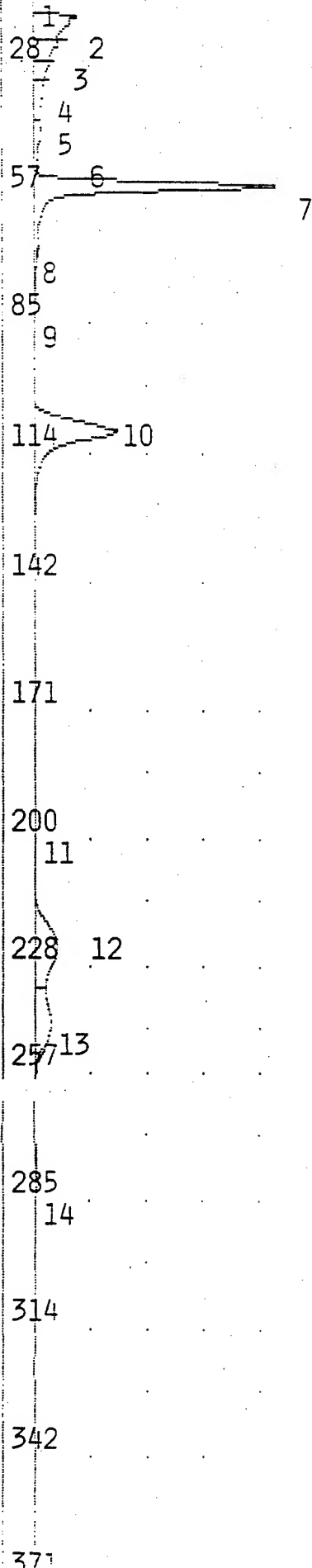
SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000
ANALYSIS TIME 400.0 SEC

PEAK REPORT

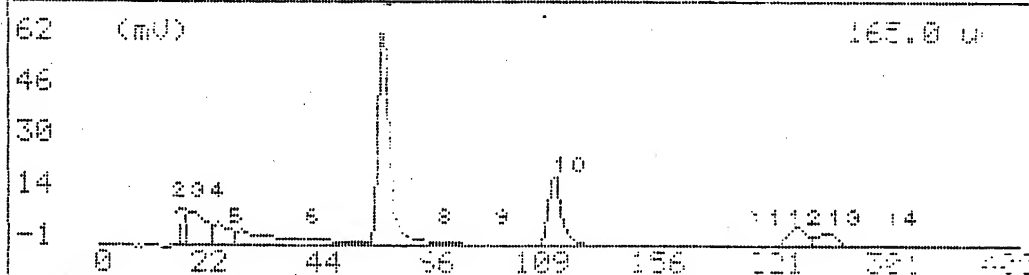
PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.045 MVS	13.8
2	UNKNOWN	14.20 MVS	15.4
3	UNKNOWN	38.20 MVS	16.8
4	UNKNOWN	23.60 MVS	22.0
5	UNKNOWN	39.14 MVS	26.0
6	UNKNOWN	16.85 MVS	40.8
7	BENZENE	85.59 PPB	53.2
8	UNKNOWN	1.026 MVS	66.8
9	UNKNOWN	0.226 MVS	84.0
10	TOLUENE	85.32 PPB	107.3
11	UNKNOWN	0.833 MVS	198.0
12	ETHYLBENZENE	81.49 PPB	222.6
13	M,P-XYLENE	165.5 PPB	239.0
14	O-XYLENE	83.28 PPB	281.8

NOTES

JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX

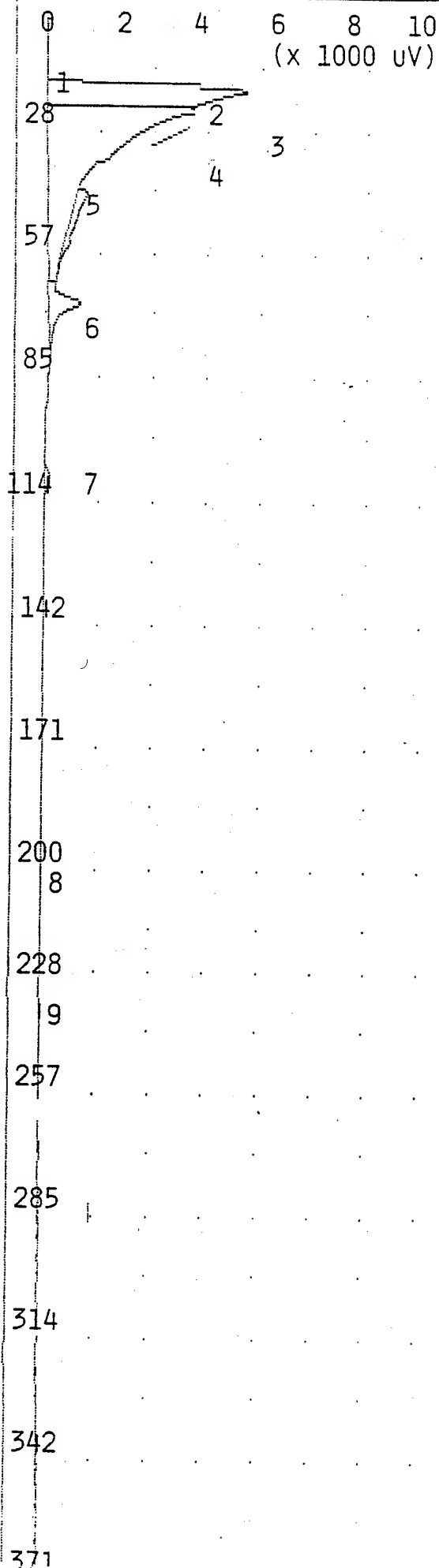


G.C. Ready		10:14 GC Function		11.55	14
-- Analysis No 21		-- Run at --		May 11 1995	11:07
Pk No	Name	Conc/Area	File	Ret. Time	
6	Unknown	16.85 mUS	-No-	46.0	00.00
7	benzene	100.0 ppb	-No-	46.0	00.00
8	Unknown	1.026 mUS	-No-	66.0	00.00
9	Unknown	0.226 mUS	-No-	66.0	00.00
10	toluene	100.0 ppb	-No-	100.0	00.00
11	Unknown	0.833 mUS	-No-	100.0	00.00
12	ethylbenzene	99.9 ppb	-No-	200.0	00.00
13	m,p-xylene	199.9 ppb	-No-	200.0	00.00
14	o-xylene	100.0 ppb	-No-	200.0	00.00
- Detected 14 peaks. Use + - to scroll. [465 sec.]					



ANALYSIS #22

10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 11,95 14:28

SAMPLE TIME: MAY 11,95 14:21

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000

ANALYSIS TIME 400.0 SEC

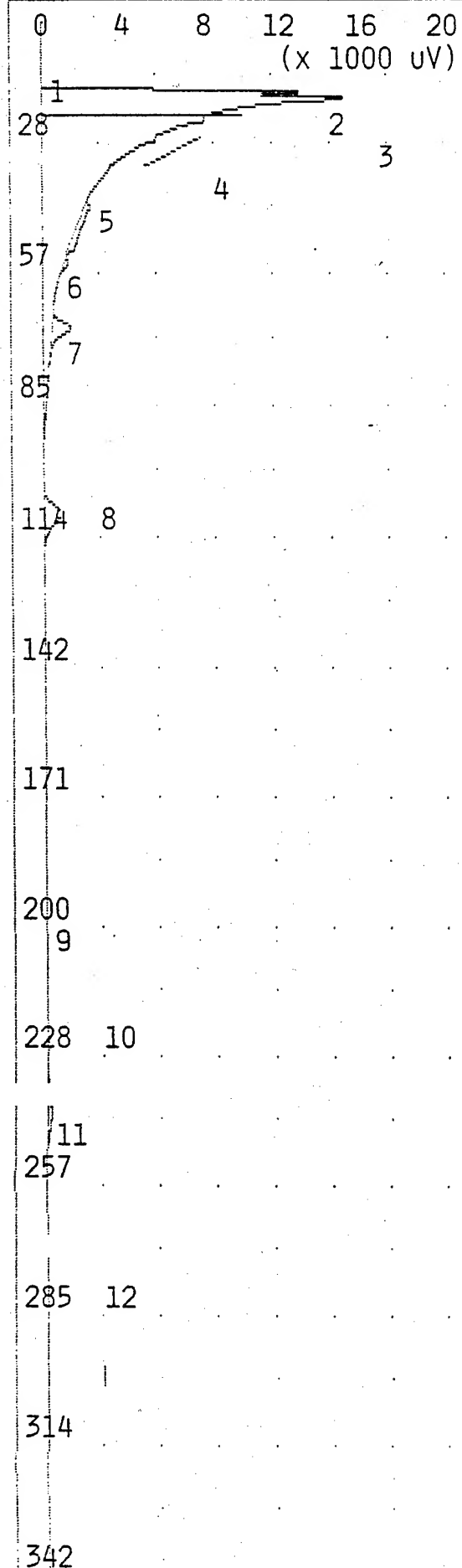
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.094 MVS	14.0
2	UNKNOWN	4.452 MVS	15.6
3	UNKNOWN	75.34 MVS	17.1
4	UNKNOWN	0.534 MVS	22.0
5	UNKNOWN	2.527 MVS	41.2
6	UNKNOWN	4.760 MVS	66.8
7	TOLUENE	1.151 PPB	106.6
8	UNKNOWN	13.58 MVS	196.8
9	M,P-XYLENE	27.29 PPB	237.8

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK

ANALYSIS #23 10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 11,95 14:38

SAMPLE TIME: MAY 11,95 14:31

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 32 C
MAX GAIN 1000
ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.189 MVS	14.0
2	UNKNOWN	13.81 MVS	15.6
3	UNKNOWN	185.6 MVS	17.0
4	UNKNOWN	0.392 MVS	22.0
5	UNKNOWN	2.708 MVS	40.8
6	BENZENE	0.191 PPB	52.4
7	UNKNOWN	3.600 MVS	66.9
8	TOLUENE	4.826 PPB	107.3
9	UNKNOWN	1.442 MVS	198.4
10	ETHYLBENZENE	2.736 PPB	223.0
11	M,P-XYLENE	13.47 PPB	239.8
12	O-XYLENE	8.640 PPB	280.0

NOTES

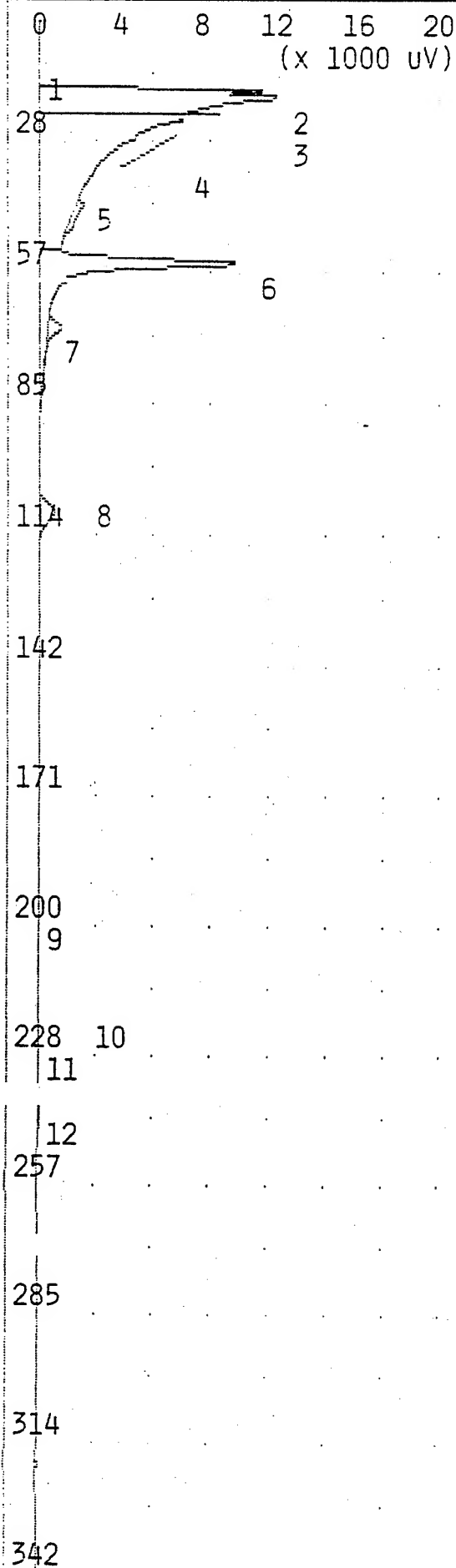
JOE BYRD, JR.

DULUTH ANGB

025-003MW

0.5- 2.5 10g

ANALYTIC #24 10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 11,95 14:48

SAMPLE TIME: MAY 11,95 14:41

METHOD

SLOPE UP 0.500 MV/SEC
 SLOPE DOWN 1.500 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 14 ML/MIN
 B/F FLOW 14 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 32 C
 MAX GAIN 1000
 ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.048 MVS	13.8
2	UNKNOWN	12.86 MVS	15.6
3	UNKNOWN	137.7 MVS	17.0
4	UNKNOWN	0.534 MVS	22.2
5	UNKNOWN	1.728 MVS	40.8
6	BENZENE	25.07 PPB	53.4
7	UNKNOWN	1.511 MVS	66.9
8	TOLUENE	4.365 PPB	107.4
9	UNKNOWN	5.100 MVS	199.2
10	ETHYLBENZENE	2.137 PPB	221.2
11	UNKNOWN	2.585 MVS	225.4
12	M,P-XYLENE	15.13 PPB	239.2

NOTES

JOE BYRD, JR.
 DULUTH ANGB
 025-003MW
 5.0- 7.0 10G

0 2 4 6 8 10
(x 100 MV)

TIME PRINTED: MAY 11,95 14:58

SAMPLE TIME: MAY 11,95 14:51

METHOD

SLOPE UP 0.500 MV/SEC

SLOPE DOWN 1.500 MV/SEC

MIN AREA 0.000 MVSEC

MIN HEIGHT 0.000 MV

ANALYSIS DELAY 0.0 SEC

WINDOW PERCENT 10.0 %

DET FLOW 14 ML/MIN

B/F FLOW 14 ML/MIN

AUX FLOW 0 ML/MIN

OVEN TEMP 40 C

AMB TEMP 32 C

MAX GAIN 1000

ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	26.22 MVS	15.6
2	UNKNOWN	756.2 MVS	18.2
3	UNKNOWN	1.044 VSEC	22.4
4	UNKNOWN	1.398 VSEC	25.0
5	UNKNOWN	1.292 VSEC	26.3
6	UNKNOWN	296.1 MVS	31.2
7	UNKNOWN	545.5 MVS	33.5
8	UNKNOWN	304.5 MVS	37.4
9	UNKNOWN	671.1 MVS	42.0
10	UNKNOWN	146.1 MVS	44.7
11	UNKNOWN	597.3 MVS	46.9
12	BENZENE	773.7 PPB	53.5
13	UNKNOWN	18.20 MVS	73.0
14	UNKNOWN	10.26 MVS	78.4
15	UNKNOWN	2.362 MVS	83.3
16	UNKNOWN	5.419 MVS	92.8
17	TOLUENE	350.4 PPB	107.3
18	ETHYLBENZENE	297.4 PPB	222.6
19	M,P-XYLENE	1.838 PPM	239.2
20	O-XYLENE	827.1 PPB	280.8
21	UNKNOWN	50.55 MVS	328.8

NOTES

JOE BYRD, JR.

DULUTH ANGB

025-003MW

10.0-12.0 10G

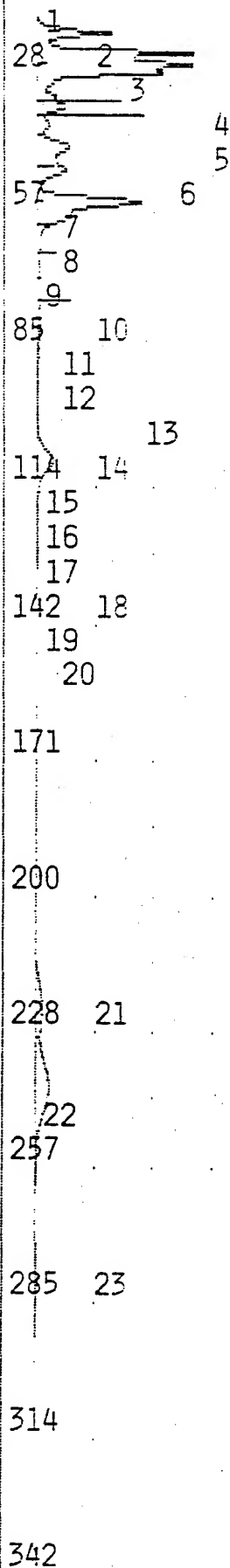
314

21

342

371

0 1 2 3 4 5
(X 100 MV)



TIME PRINTED: MAY 11,95 15:18

SAMPLE TIME: MAY 11,95 15:11

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 32 C
MAX GAIN 1000
ANALYSIS TIME 400.0 SEC

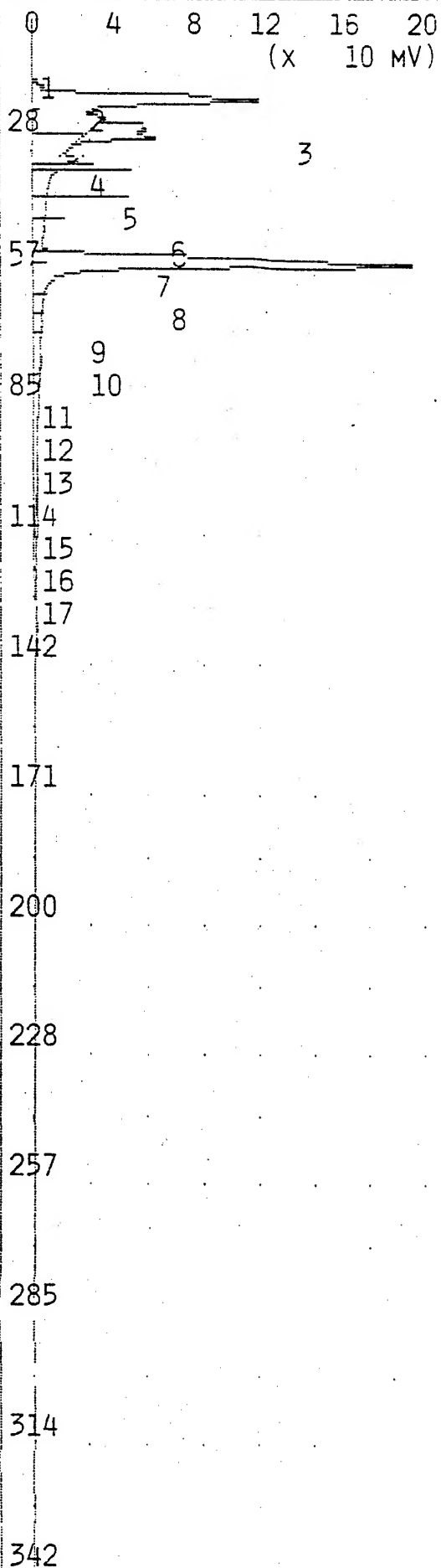
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.384 MVS	14.0
2	UNKNOWN	4.163 MVS	15.2
3	UNKNOWN	160.0 MVS	18.0
4	UNKNOWN	289.0 MVS	22.1
5	UNKNOWN	369.2 MVS	24.7
6	UNKNOWN	262.5 MVS	26.2
7	UNKNOWN	40.58 MVS	31.0
8	UNKNOWN	87.46 MVS	33.2
9	UNKNOWN	40.63 MVS	37.2
10	UNKNOWN	129.7 MVS	41.7
11	UNKNOWN	28.65 MVS	44.4
12	UNKNOWN	105.1 MVS	46.6
13	BENZENE	133.0 PPB	53.0
14	UNKNOWN	135.9 MVS	55.8
15	UNKNOWN	1.420 MVS	61.4
16	UNKNOWN	17.54 MVS	66.4
17	UNKNOWN	21.78 MVS	72.9
18	UNKNOWN	30.69 MVS	78.1
19	UNKNOWN	14.12 MVS	92.6
20	TOLUENE	103.3 PPB	106.6
21	ETHYLBENZENE	107.5 PPB	221.6
22	M,P-XYLENE	442.9 PPB	238.4
23	O-XYLENE	197.2 PPB	280.0

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-003MW RESHOT
10.0-12.0 10G
5X DILUTION
20 MICROLITER INJECTION

ANALYSIS #27 10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 11,95 15:38

SAMPLE TIME: MAY 11,95 15:31

METHOD

SLOPE UP 0.500 MV/SEC

SLOPE DOWN 1.500 MV/SEC

MIN AREA 0.000 MVSEC

MIN HEIGHT 0.000 MV

ANALYSIS DELAY 0.0 SEC

WINDOW PERCENT 10.0 %

DET FLOW 14 ML/MIN

B/F FLOW 14 ML/MIN

AUX FLOW 0 ML/MIN

OVEN TEMP 40 C

AMB TEMP 33 C

MAX GAIN 1000

14 ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	3.042 MVS	14.0
2	UNKNOWN	7.031 MVS	15.1
3	UNKNOWN	321.0 MVS	18.1
4	UNKNOWN	1.326 MVS	20.6
5	UNKNOWN	52.37 MVS	22.0
6	UNKNOWN	77.05 MVS	23.7
7	UNKNOWN	62.94 MVS	24.8
8	UNKNOWN	148.1 MVS	26.2
9	UNKNOWN	51.26 MVS	31.0
10	UNKNOWN	69.98 MVS	33.0
11	UNKNOWN	15.28 MVS	40.7
12	UNKNOWN	27.29 MVS	42.2
13	UNKNOWN	25.43 MVS	46.6
14	BENZENE	221.8 PPB	53.1
15	UNKNOWN	0.109 MVS	66.4
16	TOLUENE	13.57 PPB	106.5
17	UNKNOWN	10.33 MVS	120.0

NOTES

JOE BYRD, JR.

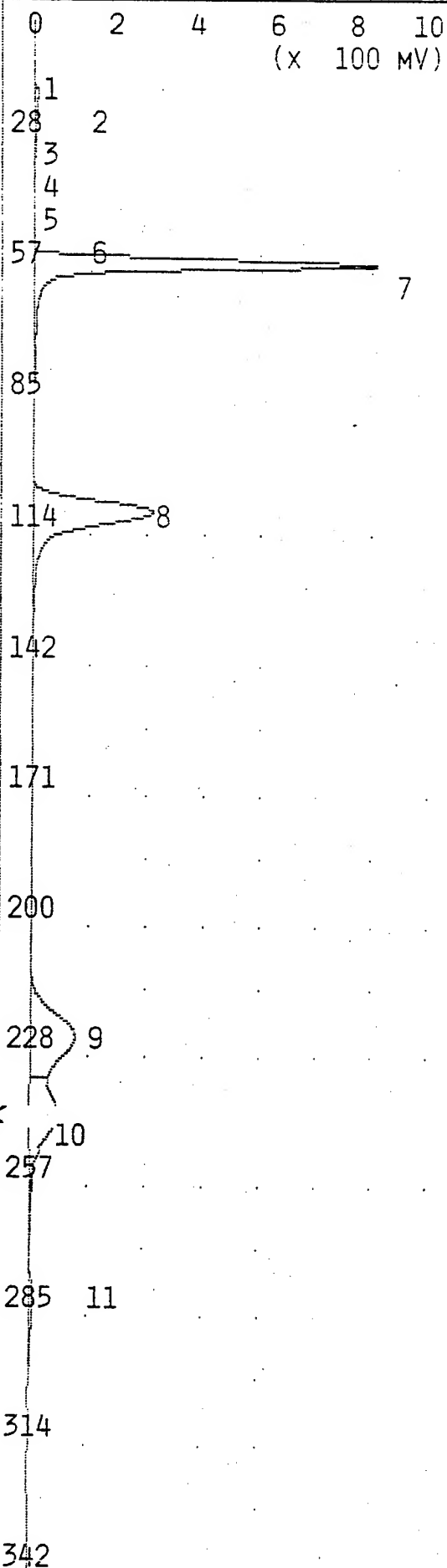
DULUTH ANGB

025-003MW

15.0-17.0 10G

10X DILUTION

10 MICROLITER INJECTION



TIME PRINTED: MAY 11,95 15:52
 SAMPLE TIME: MAY 11,95 15:45

METHOD

SLOPE UP 0.500 MV/SEC
 SLOPE DOWN 1.500 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 14 ML/MIN
 B/F FLOW 14 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 33 C
 MAX GAIN 1000
 ANALYSIS TIME 400.0 SEC

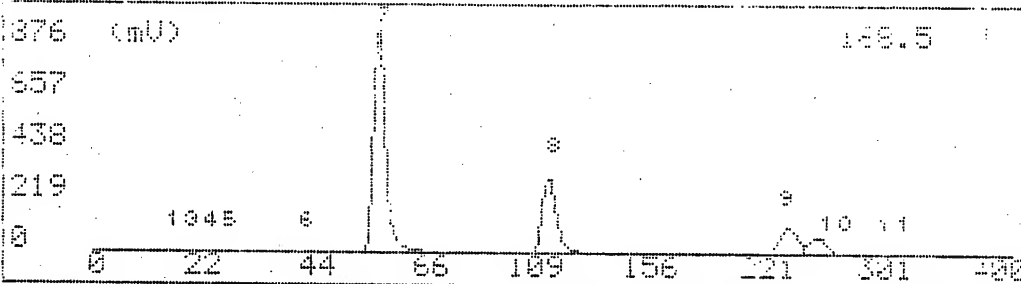
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.038 MVS	14.2
2	UNKNOWN	14.35 MVS	15.6
3	UNKNOWN	43.29 MVS	17.0
4	UNKNOWN	29.01 MVS	22.2
5	UNKNOWN	40.85 MVS	26.2
6	UNKNOWN	11.51 MVS	40.7
7	BENZENE	696.2 PPB	53.6
8	TOLUENE	679.1 PPB	107.4
9	ETHYLBENZENE	658.2 PPB	222.6
10	M,P-XYLENE	1.389 PPM	239.2
11	O-XYLENE	585.5 PPB	280.5

NOTES

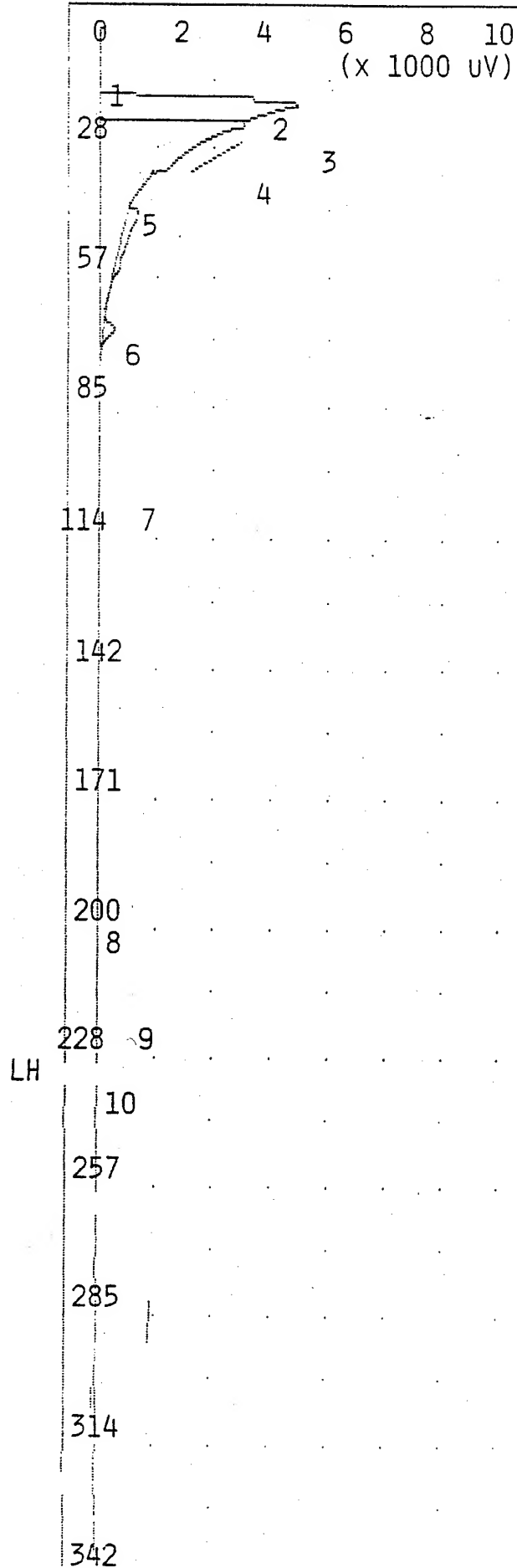
JOE BYRD, JR.
 DULUTH ANGB
 1 PPM BTEX STD

File: 30004		Date: 10/10/98		Time: 10:10	
Sample: 40-26		Run: 10		Scan: 10	
Peak	Name	Conc	Area	Height	Width
3	Unknown	43.36	10000	10000	10000
4	Unknown	10.00	10000	10000	10000
5	Unknown	10.00	10000	10000	10000
6	Unknown	10.00	10000	10000	10000
7	Benzene	1.0000	10000	10000	10000
8	Toluene	1.0000	10000	10000	10000
9	Ethylbenzene	1.0000	10000	10000	10000
10	m,p-xylene	2.0000	10000	10000	10000
11	o-xylene	1.0000	10000	10000	10000



ANALYSIS #29

10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 11,95 16:07

SAMPLE TIME: MAY 11,95 16:01

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 33 C
MAX GAIN 1000
ANALYSIS TIME 400.0 SEC

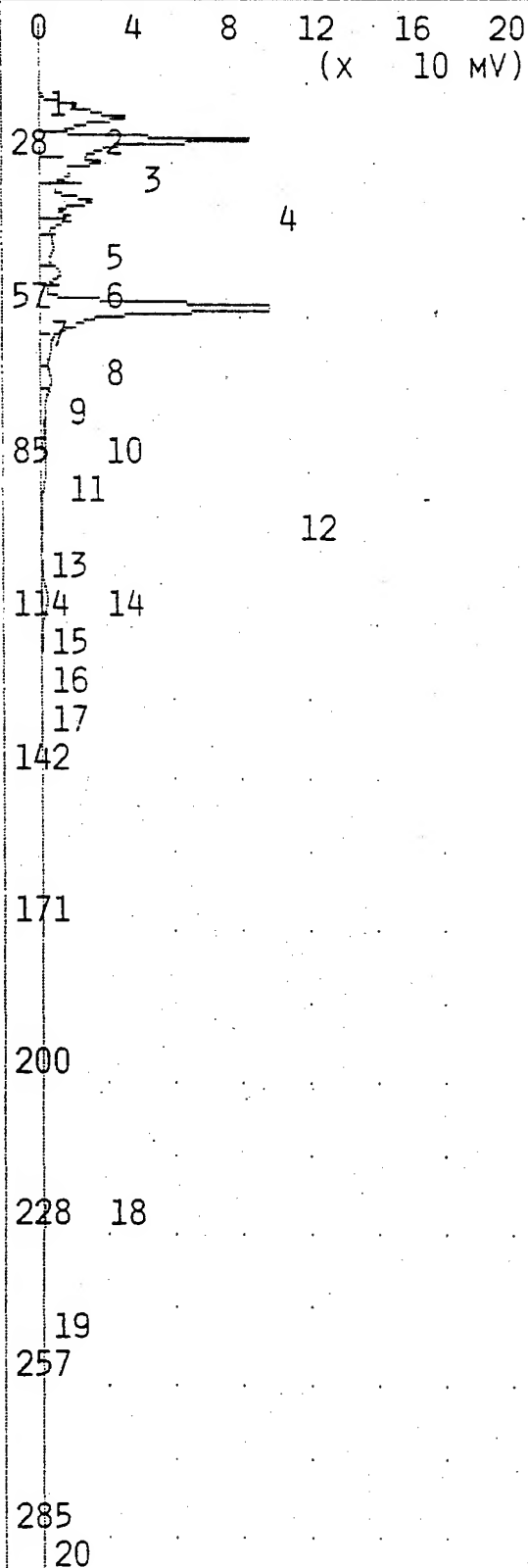
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.015 MVS	14.1
2	UNKNOWN	4.188 MVS	15.6
3	UNKNOWN	72.35 MVS	17.1
4	UNKNOWN	0.135 MVS	22.0
5	UNKNOWN	2.584 MVS	41.0
6	UNKNOWN	1.104 MVS	67.0
7	TOLUENE	1.287 PPB	107.2
8	UNKNOWN	0.831 MVS	201.4
9	ETHYLBENZENE	0.887 PPB	222.4
10	M;P-XYLENE	2.824 PPB	237.4

NOTES

JOE BYRD, JR.
DULUTH ANGB

~~1 PPM BTEX STD~~
AIR BLANK JB



TIME PRINTED: MAY 11,95 16:18

SAMPLE TIME: MAY 11,95 16:12

METHOD

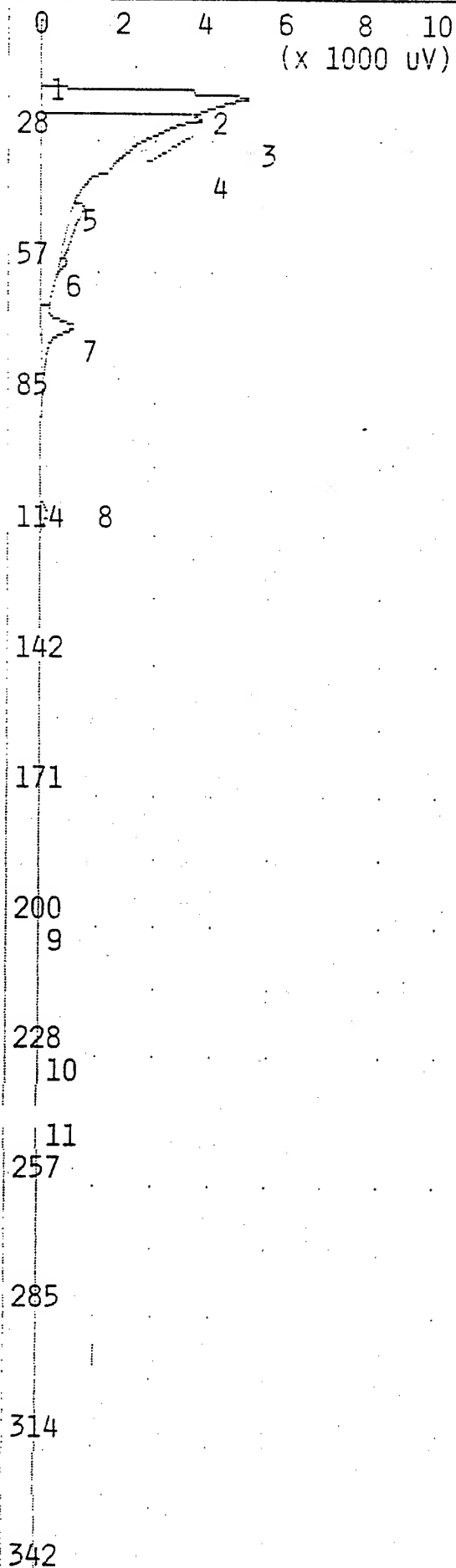
SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 33 C
MAX GAIN 1000
ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	2.360 MVS	14.2
2	UNKNOWN	18.66 MVS	15.6
3	UNKNOWN	107.0 MVS	18.2
4	UNKNOWN	191.1 MVS	22.3
5	UNKNOWN	46.24 MVS	26.4
6	UNKNOWN	30.62 MVS	28.6
7	UNKNOWN	7.651 MVS	31.1
8	UNKNOWN	54.63 MVS	33.5
9	UNKNOWN	39.68 MVS	36.8
10	UNKNOWN	26.07 MVS	42.4
11	UNKNOWN	36.19 MVS	47.0
12	BENZENE	148.8 PPB	53.4
13	UNKNOWN	49.73 MVS	66.9
14	UNKNOWN	0.370 MVS	72.9
15	UNKNOWN	0.114 MVS	78.9
16	UNKNOWN	17.78 MVS	84.0
17	TOLUENE	14.79 PPB	107.4
18	ETHYLBENZENE	9.370 PPB	223.2
19	M,P-XYLENE	24.88 PPB	240.5
20	O-XYLENE	15.88 PPB	284.2

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-003MW
20.0-22.0 10g



TIME PRINTED: MAY 11,95 16:34

SAMPLE TIME: MAY 11,95 16:27

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 33 C
MAX GAIN 1000
ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.202 MVS	14.2
2	UNKNOWN	4.079 MVS	15.7
3	UNKNOWN	76.47 MVS	17.1
4	UNKNOWN	0.660 MVS	22.0
5	UNKNOWN	2.241 MVS	41.0
6	BENZENE	0.158 PPB	53.0
7	UNKNOWN	4.291 MVS	67.3
8	TOLUENE	1.298 PPB	107.6
9	UNKNOWN	0.789 MVS	200.8
10	ETHYLBENZENE	0.629 PPB	228.2
11	M,P-XYLENE	2.178 PPB	238.4

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK

0 2 4 6 8 10
(X 10 MV)

TIME PRINTED: MAY 13,95 08:55

SAMPLE TIME: MAY 13,95 08:48

METHOD

SLOPE UP 0.500 MV/SEC

SLOPE DOWN 1.500 MV/SEC

MIN AREA 0.000 MVSEC

MIN HEIGHT 0.000 MV

ANALYSIS DELAY 0.0 SEC

WINDOW PERCENT 10.0 %

DET FLOW 14 ML/MIN

B/F FLOW 14 ML/MIN

AUX FLOW 0 ML/MIN

OVEN TEMP 40 C

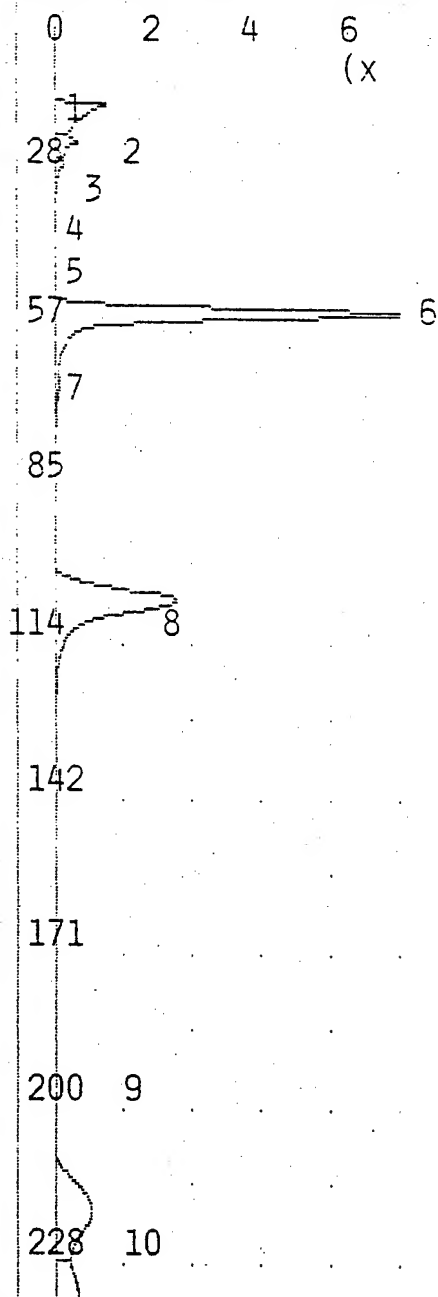
AMB TEMP 27 C

MAX GAIN 1000

ANALYSIS TIME 400.0 SEC

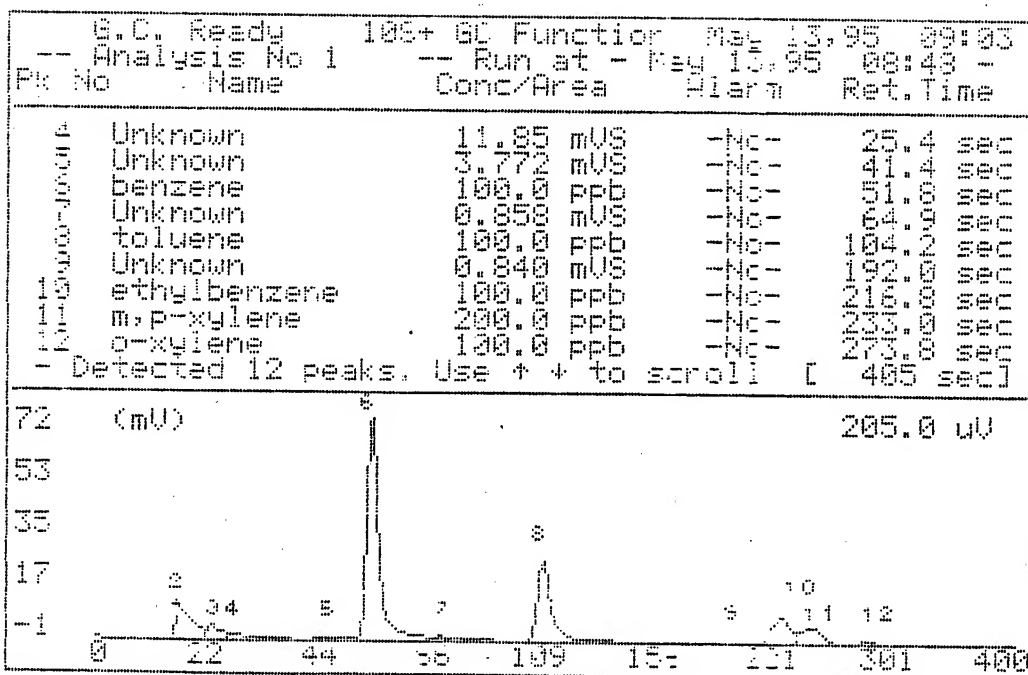
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.050 MVS	13.4
2	UNKNOWN	38.52 MVS	15.2
3	UNKNOWN	14.16 MVS	21.4
4	UNKNOWN	11.85 MVS	25.4
5	UNKNOWN	3.772 MVS	41.4
6	UNKNOWN	212.0 MVS	51.8
7	UNKNOWN	0.858 MVS	64.9
8	UNKNOWN	162.2 MVS	104.2
9	UNKNOWN	0.840 MVS	192.0
10	UNKNOWN	106.4 MVS	216.8
11	UNKNOWN	78.16 MVS	233.0
12	UNKNOWN	16.18 MVS	273.8

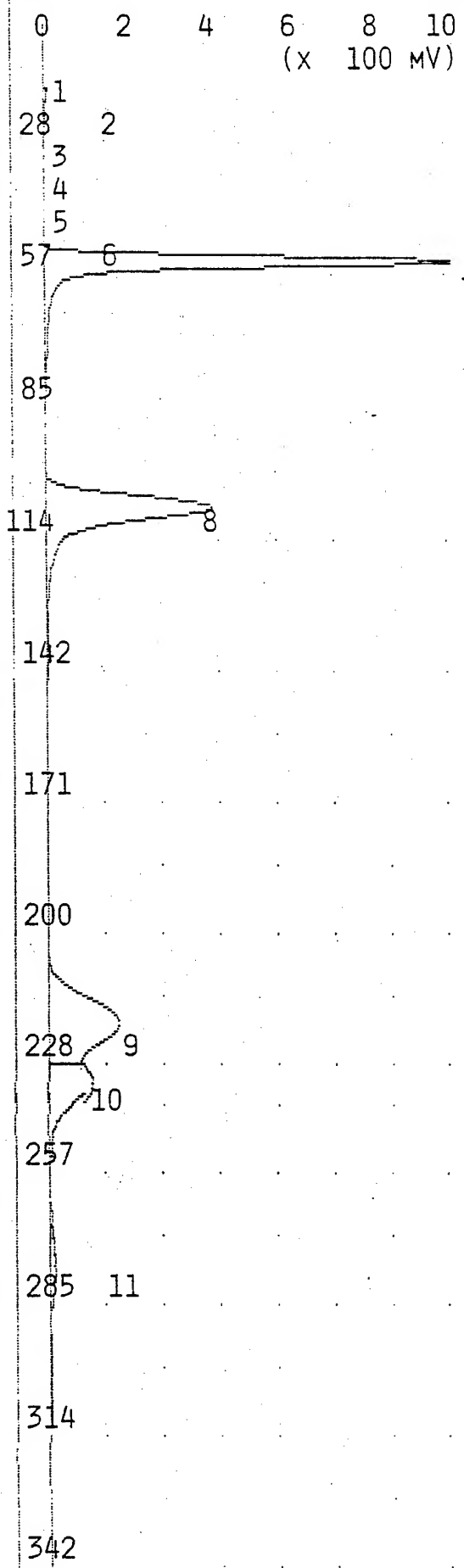


NOTES

JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX



ANALYSIS #2 10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 13,95 09:11
SAMPLE TIME: MAY 13,95 09:04

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 28 C
MAX GAIN 1000

ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.038 MVS	13.4
2	UNKNOWN	13.15 MVS	15.2
3	UNKNOWN	31.12 MVS	16.6
4	UNKNOWN	18.11 MVS	21.6
5	UNKNOWN	15.68 MVS	25.6
6	UNKNOWN	2.735 MVS	41.4
7	BENZENE	1.639 PPM	52.5
8	TOLUENE	1.852 PPM	105.4
9	ETHYLBENZENE	2.147 PPM	217.6
10	M,P-XYLENE	3.827 PPM	233.8
11	O-XYLENE	2.327 PPM	274.1

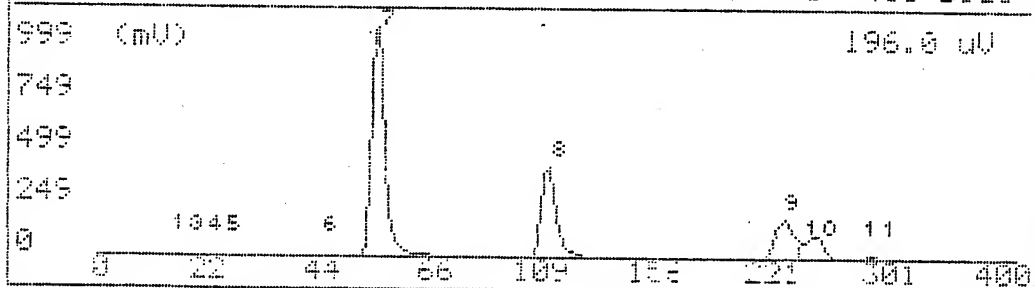
NOTES

JOE BYRD, JR.
DULUTH ANGB
1 PPM BTEX

3.C. Ready .08+ GC Function May 13, 95 10:16
 -- Analysis No 2 -- Run at -- May 13, 95 09:54 --
 Pk No Name Conc/Area Hiarm Ret. time

1	Unknown	31.13 mUS	-No-	16.6 sec
2	Unknown	18.11 mUS	-No-	21.6 sec
3	Unknown	15.72 mUS	-No-	23.6 sec
4	Unknown	2.774 mUS	-No-	41.6 sec
5	benzene	1.000 ppm	-No-	52.6 sec
6	toluene	1.000 ppm	-No-	105.4 sec
7	ethylbenzene	1.000 ppm	-No-	217.6 sec
8	m,p-xylene	2.000 ppm	-No-	233.6 sec
9	o-xylene	1.000 ppm	-No-	274.1 sec

- Detected 11 peaks. Use + + to scroll [405 sec]



ANALYSIS #3

10S+ GC FUNCTION ANALYSIS REPORT

0 2 4 6 8 10
(x 100 MV)

TIME PRINTED: MAY 13,95 09:24

SAMPLE TIME: MAY 13,95 09:18

METHOD

SLOPE UP 0.500 MV/SEC

SLOPE DOWN 1.500 MV/SEC

MIN AREA 0.000 MV/SEC

MIN HEIGHT 0.000 MV

ANALYSIS DELAY 0.0 SEC

WINDOW PERCENT 10.0 %

DET FLOW 14 ML/MIN

B/F FLOW 14 ML/MIN

AUX FLOW 0 ML/MIN

OVEN TEMP 40 C

AMB TEMP 28 C

MAX GAIN 1000

ANALYSIS TIME 400.0 SEC

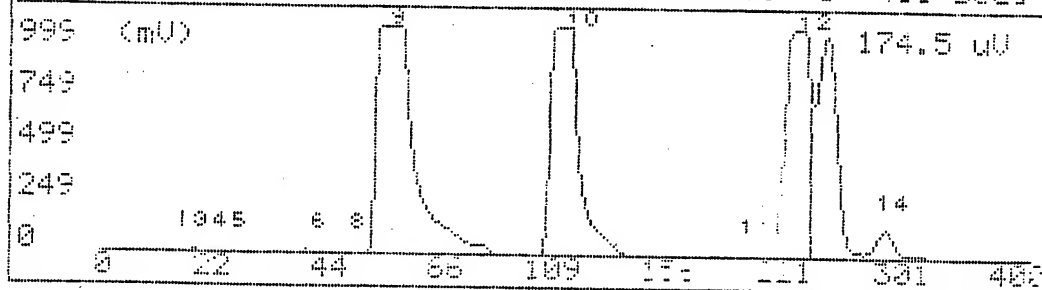
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.054 MVS	13.8
2	UNKNOWN	10.38 MVS	15.2
3	UNKNOWN	55.30 MVS	16.8
4	UNKNOWN	30.16 MVS	21.8
5	UNKNOWN	31.95 MVS	25.7
6	UNKNOWN	1.252 MVS	39.4
7	UNKNOWN	2.252 MVS	40.6
8	UNKNOWN	0.157 MVS	45.6
9	BENZENE	4.828 PPM	53.2
10	TOLUENE	6.827 PPM	106.2
11	UNKNOWN	17.78 MVS	187.8
12	ETHYLBENZENE	8.992 PPM	218.8
13	M,P-XYLENE	16.59 PPM	234.4
14	O-XYLENE	6.053 PPM	274.9

NOTES

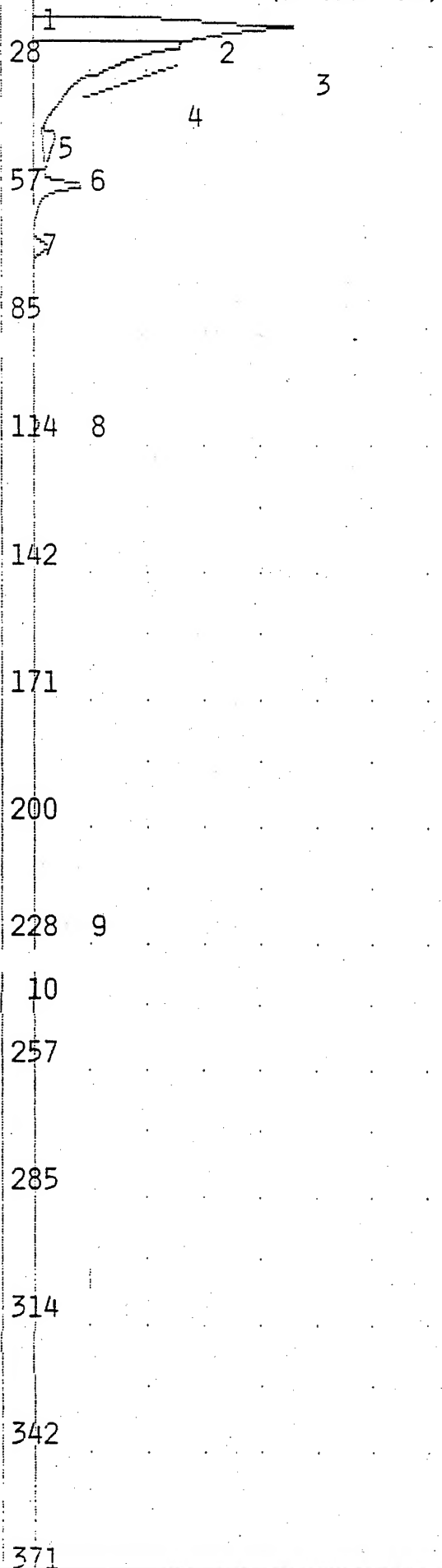
JOE BYRD, JR.
DULUTH ANGB
10 PPM BTEX

E.C. Ready		100+ GC Function	13.95	09:20
-- Analysis No 3		-- Run at	13.95	09:10
Pk No	Name	Conc/Area	Area	Ret. Time
1	Unknown	1.252 mUS	-No-	39.4 sec
2	Unknown	2.252 mUS	-No-	45.6 sec
3	Unknown	0.157 mUS	-No-	45.6 sec
4	benzene	10.00 ppm	-No-	53.2 sec
10	toluene	10.00 ppm	-No-	106.2 sec
11	Unknown	17.78 mUS	-No-	187.0 sec
12	ethylbenzene	10.00 ppm	-No-	218.8 sec
13	m,p-xylene	20.00 ppm	-No-	234.4 sec
14	o-xylene	10.01 ppm	-No-	274.9 sec
- Detected 14 peaks. Use + + to scroll. [405 sec]				



ANALYSIS #4

10S+ GC FUNCTION ANALYSIS REPORT

0 2 4 6 8 10
(x 1000 UV)

TIME PRINTED: MAY 13,95 09:38

SAMPLE TIME: MAY 13,95 09:31

METHOD

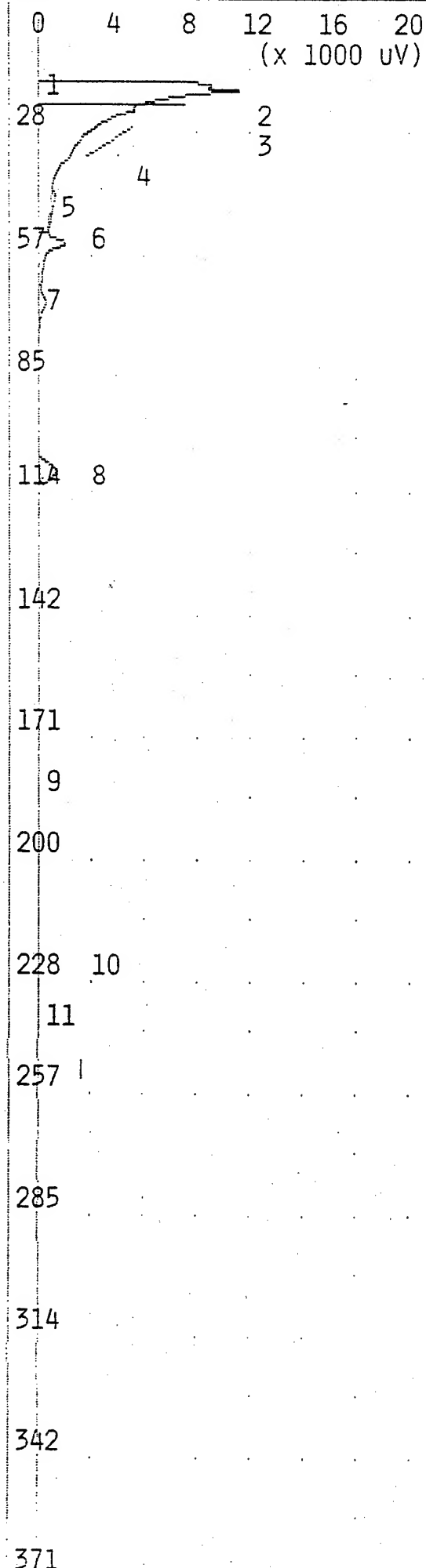
SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 28 C
MAX GAIN 1000
ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.082 MVS	13.5
2	UNKNOWN	4.908 MVS	15.4
3	UNKNOWN	64.84 MVS	16.8
4	UNKNOWN	0.384 MVS	21.5
5	UNKNOWN	1.583 MVS	41.5
6	BENZENE	4.368 PPB	52.1
7	UNKNOWN	5.403 MVS	65.6
8	TOLUENE	2.513 PPB	105.7
9	ETHYLBENZENE	7.607 PPB	218.4
10	M,P-XYLENE	14.32 PPB	233.4

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK



TIME PRINTED: MAY 13, 95 09:48

SAMPLE TIME: MAY 13, 95 09:41

METHOD

SLOPE UP 0.500 MV/SEC
 SLOPE DOWN 1.500 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 14 ML/MIN
 B/F FLOW 14 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 29 C
 MAX GAIN 1000
 ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.031 MVS	13.6
2	UNKNOWN	11.75 MVS	15.3
3	UNKNOWN	94.62 MVS	16.7
4	UNKNOWN	0.457 MVS	21.6
5	UNKNOWN	1.048 MVS	41.0
6	BENZENE	3.724 PPB	52.2
7	UNKNOWN	3.857 MVS	66.1
8	TOLUENE	4.311 PPB	105.7
9	UNKNOWN	3.199 MVS	177.6
10	ETHYLBENZENE	4.346 PPB	218.8
11	M,P-XYLENE	9.210 PPB	233.4

NOTES

JOE BYRD, JR.
 DULUTH ANGB
 025-009BH
 0.5- 2.5 10G

0 4 8 12 16 20
(x 1000 UV)

TIME PRINTED: MAY 13,95 09:59

SAMPLE TIME: MAY 13,95 09:52

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 29 C
MAX GAIN 1000
ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.570 MVS	13.9
2	UNKNOWN	12.84 MVS	15.2
3	UNKNOWN	39.49 MVS	16.8
4	UNKNOWN	50.78 MVS	21.7
5	UNKNOWN	10.41 MVS	41.0
6	BENZENE	3.098 PPB	52.6
7	UNKNOWN	4.202 MVS	66.2
8	TOLUENE	3.969 PPB	105.6
9	UNKNOWN	0.294 MVS	124.2
10	UNKNOWN	0.474 MVS	180.2
11	UNKNOWN	3.136 MVS	198.4
12	ETHYLBENZENE	3.380 PPB	218.8
13	M,P-XYLENE	2.321 PPB	234.6
14	UNKNOWN	1.483 MVS	237.6

NOTES

JOE BYRD, JR.

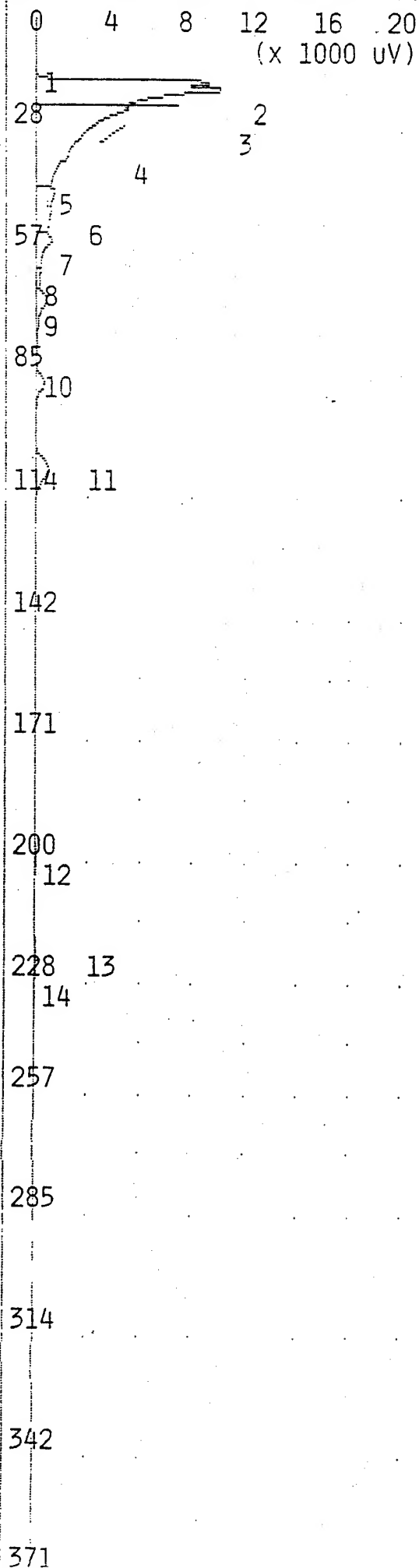
DULUTH ANGB

025-009BH

5.0- 7.0 10G

1
28
57
85
114
142
171
200
228
257
285
314
342
371

2
3
4
5
6
7
8
9
10
11
12
13
14



TIME PRINTED: MAY 13, 95 10:09

SAMPLE TIME: MAY 13, 95 10:03

METHOD

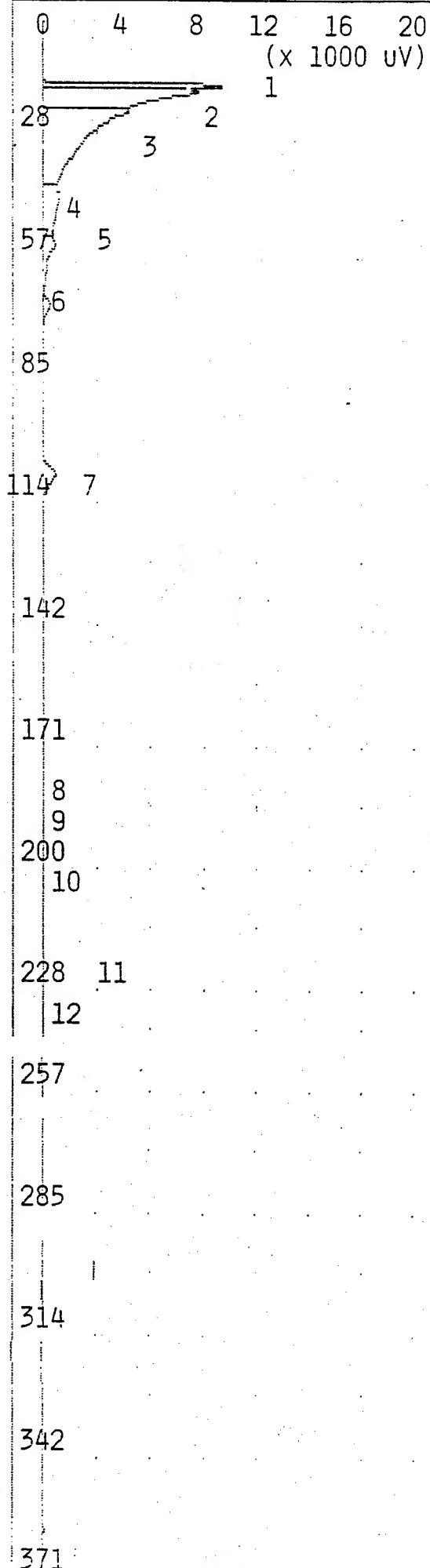
SLOPE UP 0.500 MV/SEC
 SLOPE DOWN 1.500 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 14 ML/MIN
 B/F FLOW 14 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 29 C
 MAX GAIN 1000
 ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.048 MVS	11.0
2	UNKNOWN	13.11 MVS	15.2
3	UNKNOWN	83.85 MVS	17.2
4	UNKNOWN	0.924 MVS	21.8
5	UNKNOWN	0.015 MVS	39.2
6	UNKNOWN	10.31 MVS	40.8
7	BENZENE	2.510 PPB	52.5
8	UNKNOWN	1.613 MVS	59.2
9	UNKNOWN	5.620 MVS	66.4
10	UNKNOWN	3.196 MVS	85.6
11	TOLUENE	3.173 PPB	105.7
12	UNKNOWN	2.049 MVS	197.4
13	ETHYLBENZENE	0.102 PPB	216.8
14	UNKNOWN	0.890 MVS	222.6

NOTES

JOE BYRD, JR.
 DULUTH ANGB
 025-009BH
 10.0-12.0 10G



TIME PRINTED: MAY 13,95 10:20

SAMPLE TIME: MAY 13,95 10:13

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 29 C
MAX GAIN 1000

ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	13.55 MVS	15.4
2	UNKNOWN	32.71 MVS	16.8
3	UNKNOWN	40.86 MVS	21.9
4	UNKNOWN	10.27 MVS	40.8
5	BENZENE	2.234 PPB	52.2
6	UNKNOWN	2.847 MVS	66.4
7	TOLUENE	3.209 PPB	106.1
8	UNKNOWN	0.121 MVS	177.0
9	UNKNOWN	0.113 MVS	183.6
10	UNKNOWN	1.343 MVS	196.0
11	ETHYLBENZENE	1.352 PPB	222.6
12	M,P-XYLENE	4.279 PPB	236.6

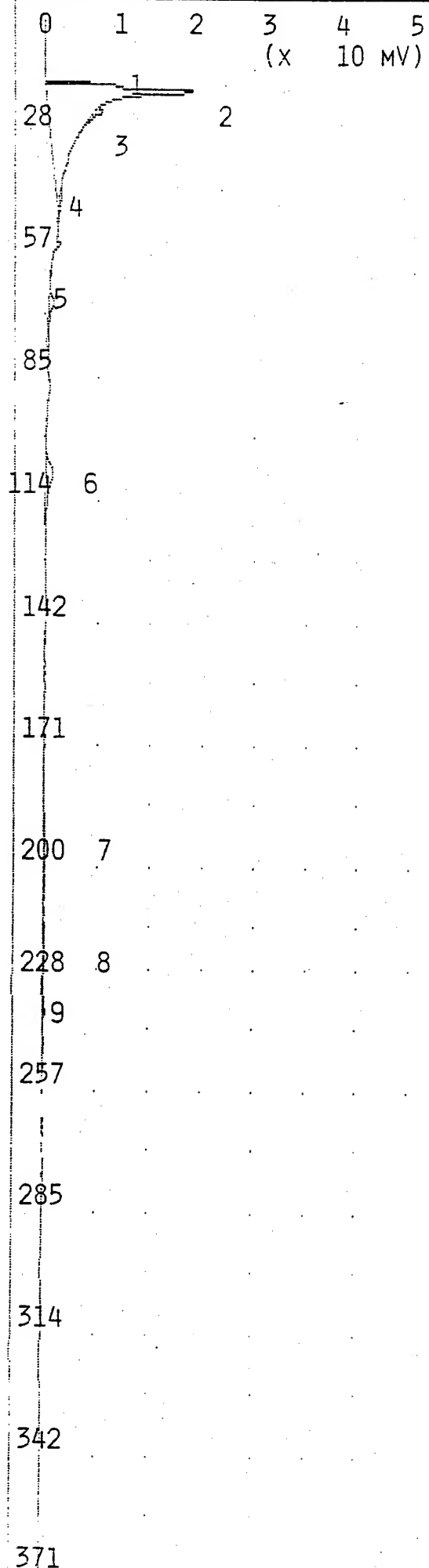
NOTES

JOE BYRD, JR.

DULUTH ANGB

025-011BH

0.5- 2.5 10G



TIME PRINTED: MAY 13,95 10:30

SAMPLE TIME: MAY 13,95 10:23

METHOD

SLOPE UP 1.000 MV/SEC
SLOPE DOWN 3.000 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 29 C
MAX GAIN 1000
ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	9.868 MVS	15.4
2	UNKNOWN	121.7 MVS	16.9
3	UNKNOWN	1.529 MVS	21.9
4	UNKNOWN	0.973 MVS	41.0
5	UNKNOWN	2.854 MVS	66.4
6	TOLUENE	3.718 PPB	106.2
7	UNKNOWN	1.185 MVS	194.8
8	ETHYLBENZENE	2.205 PPB	221.2
9	M,P-XYLENE	5.703 PPB	238.0

NOTES

JOE BYRD, JR.

DULUTH ANGB

025-011BH

5.0- 7.0 10G

0 2 4 6 8 10
(X 10 MV)

TIME PRINTED: MAY 13,95 10:40

SAMPLE TIME: MAY 13,95 10:33

METHOD

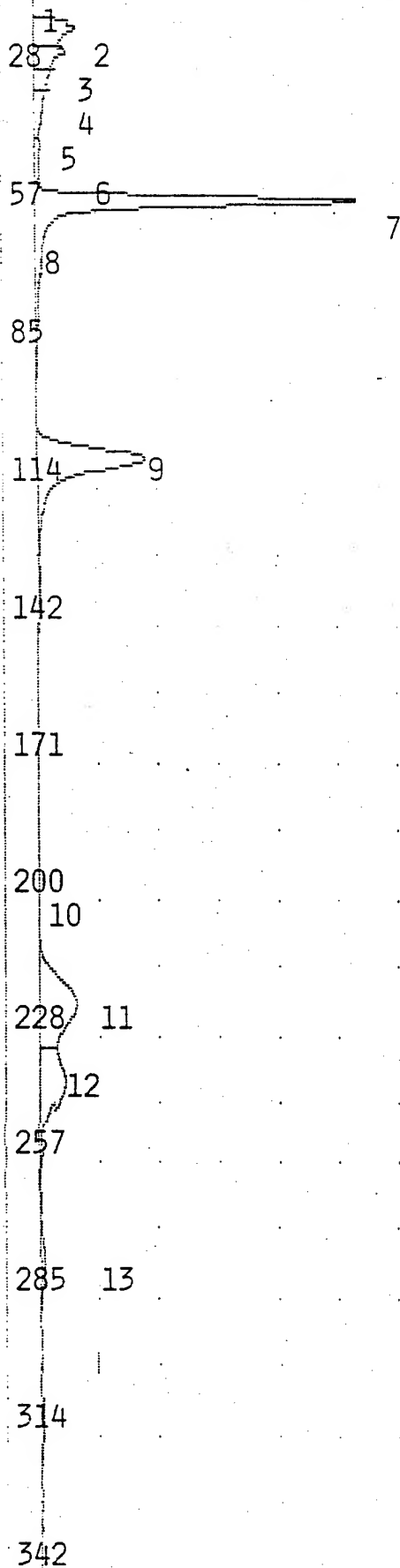
SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 29 C
MAX GAIN 1000
ANALYSIS TIME 400.0 SEC

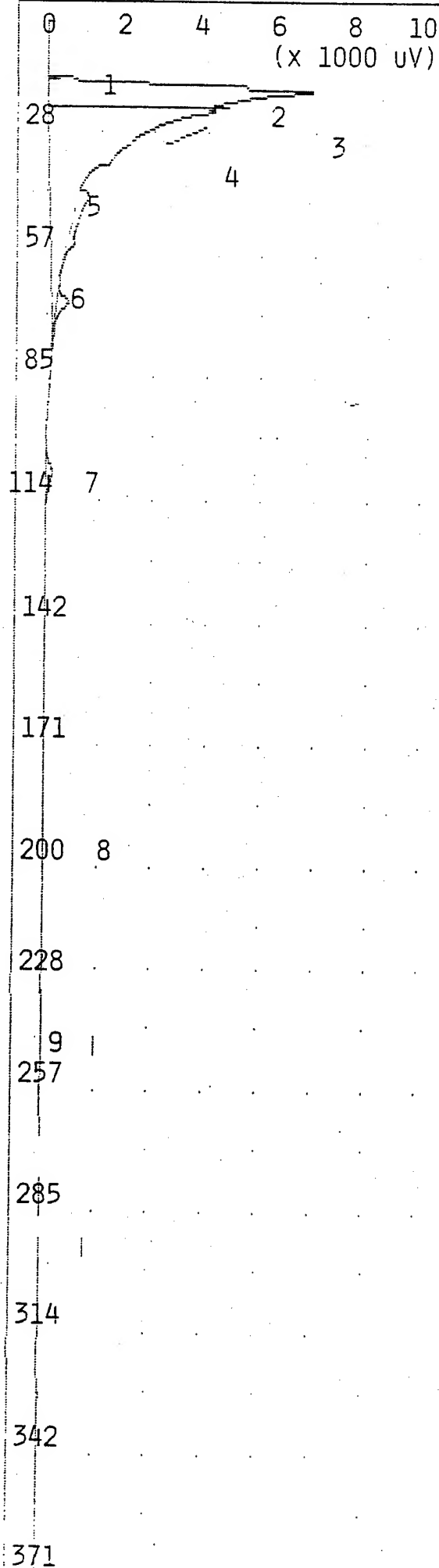
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.037 MVS	13.6
2	UNKNOWN	9.026 MVS	15.4
3	UNKNOWN	36.52 MVS	16.9
4	UNKNOWN	25.22 MVS	22.0
5	UNKNOWN	35.84 MVS	25.0
6	UNKNOWN	10.47 MVS	40.8
7	BENZENE	105.9 PPB	52.7
8	UNKNOWN	1.140 MVS	65.7
9	TOLUENE	100.4 PPB	106.1
10	UNKNOWN	0.797 MVS	195.6
11	ETHYLBENZENE	101.4 PPB	220.0
12	M,P-XYLENE	206.9 PPB	236.2
13	O-XYLENE	99.11 PPB	277.0

NOTES

JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX





TIME PRINTED: MAY 13, 95 10:50

SAMPLE TIME: MAY 13, 95 10:43

METHOD

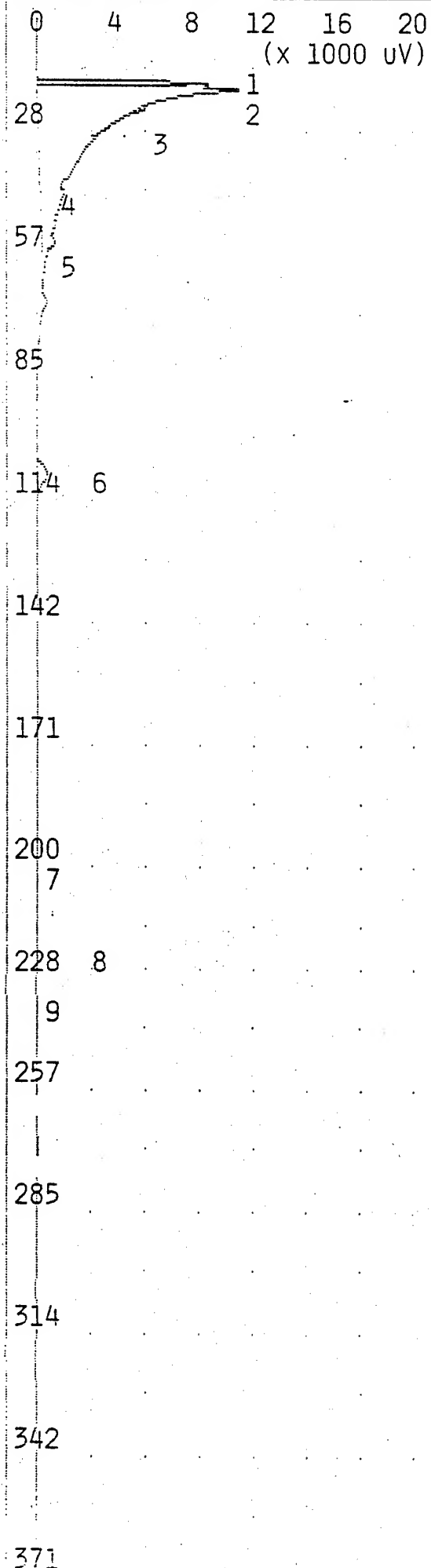
SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 M/SEC
MIN HEIGHT 0.000 M/
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 29 C
MAX GAIN 1000
ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	1.070 MVS	14.2
2	UNKNOWN	5.542 MVS	15.5
3	UNKNOWN	85.71 MVS	16.8
4	UNKNOWN	0.629 MVS	21.8
5	UNKNOWN	2.354 MVS	41.0
6	UNKNOWN	1.092 MVS	66.2
7	TOLUENE	0.753 PPB	106.4
8	UNKNOWN	0.597 MVS	193.8
9	M,P-XYLENE	3.468 PPB	238.8

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK



TIME PRINTED: MAY 13,95 11:00

SAMPLE TIME: MAY 13,95 10:54

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 29 C
MAX GAIN 1000
ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	10.91 MVS	15.4
2	UNKNOWN	108.4 MVS	16.8
3	UNKNOWN	0.369 MVS	21.8
4	UNKNOWN	1.166 MVS	40.8
5	BENZENE	0.216 PPB	52.5
6	TOLUENE	2.543 PPB	106.2
7	UNKNOWN	0.790 MVS	195.4
8	ETHYLBENZENE	1.204 PPB	220.6
9	M,P-XYLENE	2.719 PPB	236.4

NOTES

JOE BYRD, JR.

DULUTH ANGB

025-008BH

0.5- 2.5 10G

0 1 2 3 4 5
(x 100 MV)

TIME PRINTED: MAY 13,95 11:10

SAMPLE TIME: MAY 13,95 11:04

METHOD

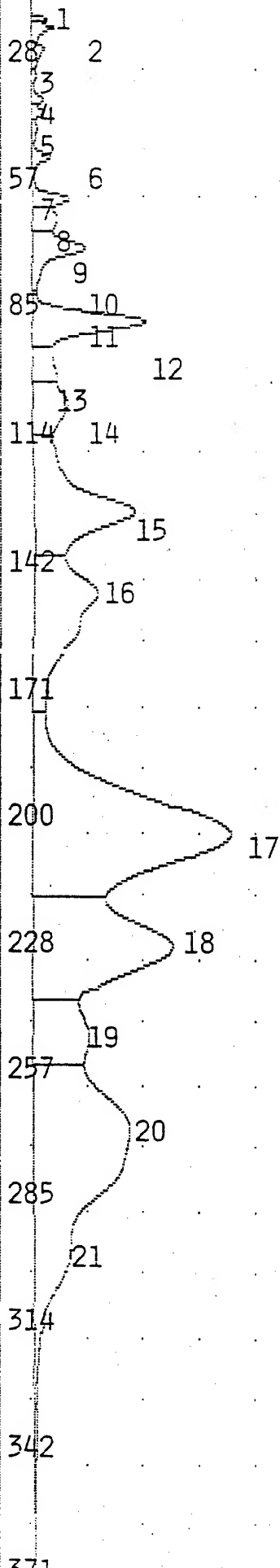
SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 29 C
MAX GAIN 1000
ANALYSIS TIME 400.0 SEC

PEAK REPORT

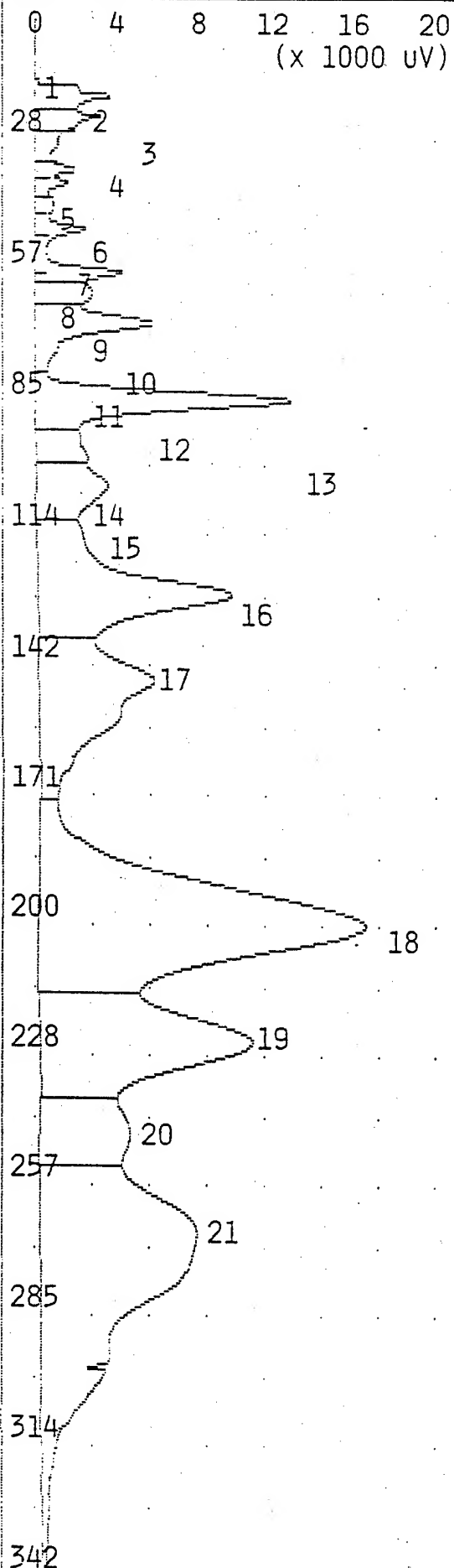
PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	29.13 MVS	15.4
2	UNKNOWN	75.27 MVS	17.4
3	UNKNOWN	64.53 MVS	22.1
4	UNKNOWN	17.10 MVS	28.0
5	UNKNOWN	41.53 MVS	33.4
6	UNKNOWN	36.00 MVS	36.4
7	UNKNOWN	28.57 MVS	40.2
8	UNKNOWN	72.05 MVS	46.4
9	BENZENE	72.22 PPB	55.8
10	UNKNOWN	146.3 MVS	60.4
11	UNKNOWN	379.0 MVS	66.9
12	UNKNOWN	781.9 MVS	83.6
13	UNKNOWN	212.3 MVS	96.2
14	TOLUENE	183.9 PPB	102.0
15	UNKNOWN	1.647 VSEC	125.7
16	UNKNOWN	1.545 VSEC	144.2
17	UNKNOWN	5.131 VSEC	198.0
18	ETHYLBENZENE	1.274 PPM	223.4
19	M,P-XYLENE	1.291 PPM	244.0
20	O-XYLENE	18.92 PPM	265.0
21	UNKNOWN	1.441 MVS	291.4

NOTES

JOE BYRD, JR
DULUTH ANGB
025-008BH
7.0- 9.0 20G



ANALYSIS #14 10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 13,95 11:28

SAMPLE TIME: MAY 13,95 11:21

METHOD

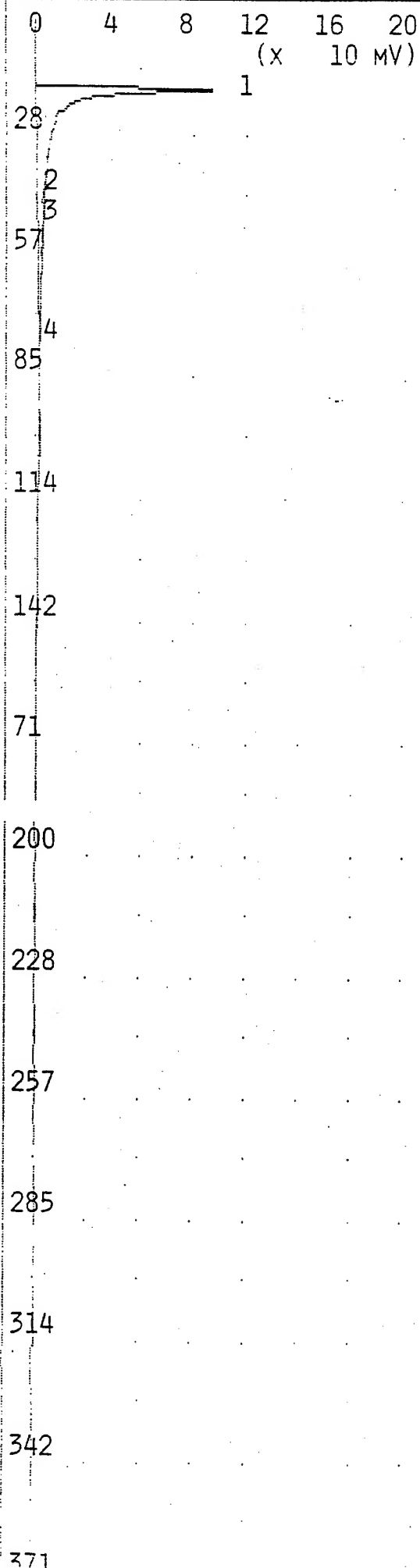
SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 29 C
MAX GAIN 1000
ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.322 MVS	14.0
2	UNKNOWN	3.064 MVS	14.9
3	UNKNOWN	13.60 MVS	17.2
4	UNKNOWN	13.18 MVS	21.6
5	UNKNOWN	3.867 MVS	27.6
6	UNKNOWN	6.124 MVS	32.9
7	UNKNOWN	4.646 MVS	36.0
8	UNKNOWN	4.462 MVS	40.6
9	UNKNOWN	9.834 MVS	46.2
10	BENZENE	7.096 PPB	55.6
11	UNKNOWN	13.83 MVS	59.5
12	UNKNOWN	34.50 MVS	66.5
13	UNKNOWN	67.10 MVS	83.3
14	UNKNOWN	17.99 MVS	95.6
15	TOLUENE	21.83 PPB	101.8
16	UNKNOWN	118.9 MVS	125.6
17	UNKNOWN	112.7 MVS	143.8
18	UNKNOWN	324.6 MVS	198.2
19	ETHYLBENZENE	126.4 PPB	223.6
20	M,P-XYLENE	157.6 PPB	244.0
21	O-XYLENE	805.7 PPB	266.1

NOTES

JOE BYRD, JR
DULUTH ANGB
025-008BH RESHOT
7.0- 9.0 20G
10 MICROLITER INJECTION



TIME PRINTED: MAY 13,95 11:43

SAMPLE TIME: MAY 13,95 11:36

METHOD

SLOPE UP	0.500	MV/SEC
SLOPE DOWN	1.500	MV/SEC
MIN AREA	0.000	MVSEC
MIN HEIGHT	0.000	MV
ANALYSIS DELAY	0.0	SEC
WINDOW PERCENT	10.0	%
DET FLOW	14	ML/MIN
B/F FLOW	14	ML/MIN
AUX FLOW	0	ML/MIN
OVEN TEMP	40	C
AMB TEMP	30	C
MAX GAIN	1000	
ANALYSIS TIME	400.0	SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	485.5 MVS	16.6
2	UNKNOWN	0.538 MVS	34.8
3	UNKNOWN	1.735 MVS	40.7
4	UNKNOWN	0.343 MVS	66.9

NOTES

JOE BYRD, JR.

DULUTH ANGB

025-008BH

9.0-11.0 10G

10 MICROLITER INJECTION

0 2 4 6 8 10
(x 1000 UV)

TIME PRINTED: MAY 13,95 11:54

SAMPLE TIME: MAY 13,95 11:47

METHOD

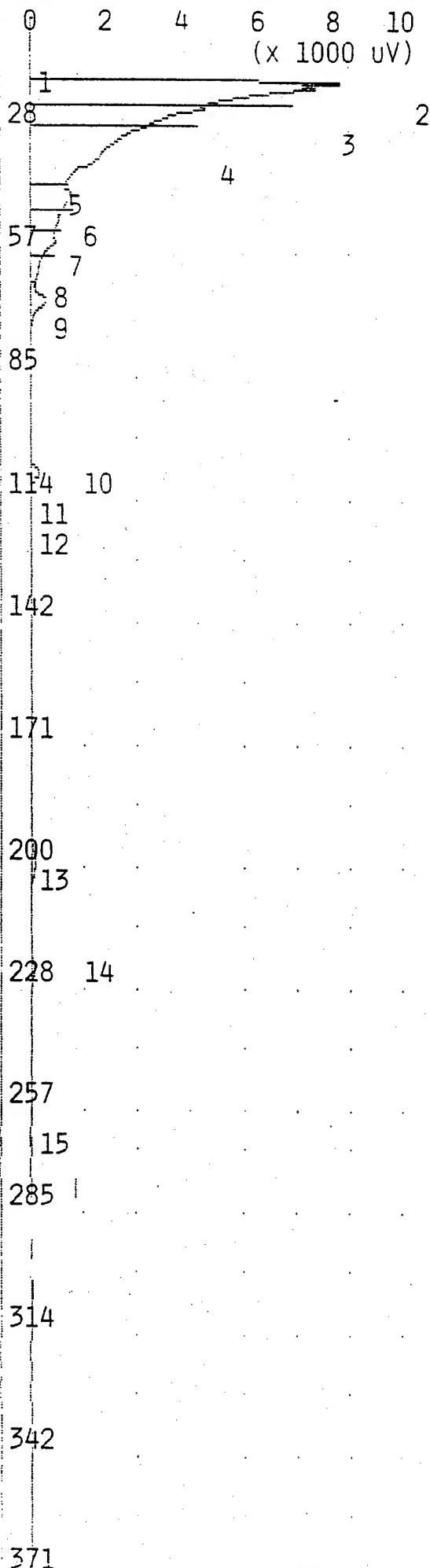
SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000
ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.023 MVS	13.6
2	UNKNOWN	10.76 MVS	15.2
3	UNKNOWN	30.78 MVS	16.7
4	UNKNOWN	46.44 MVS	21.7
5	UNKNOWN	1.399 MVS	41.0
6	UNKNOWN	5.266 MVS	42.0
7	UNKNOWN	4.864 MVS	46.0
8	BENZENE	2.285 PPB	52.4
9	UNKNOWN	3.342 MVS	66.1
10	TOLUENE	1.706 PPB	105.0
11	UNKNOWN	0.121 MVS	115.3
12	UNKNOWN	0.133 MVS	122.5
13	UNKNOWN	6.735 MVS	197.4
14	ETHYLBENZENE	6.271 PPB	222.6
15	O-XYLENE	30.13 PPB	266.4

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-008BH RESHOT
9.0-11.0 10G
50 MICROLITER INJECTION



0 2 4 6 8 10
(X 10 MV)

TIME PRINTED: MAY 13, 95 12:04

SAMPLE TIME: MAY 13, 95 11:58

METHOD

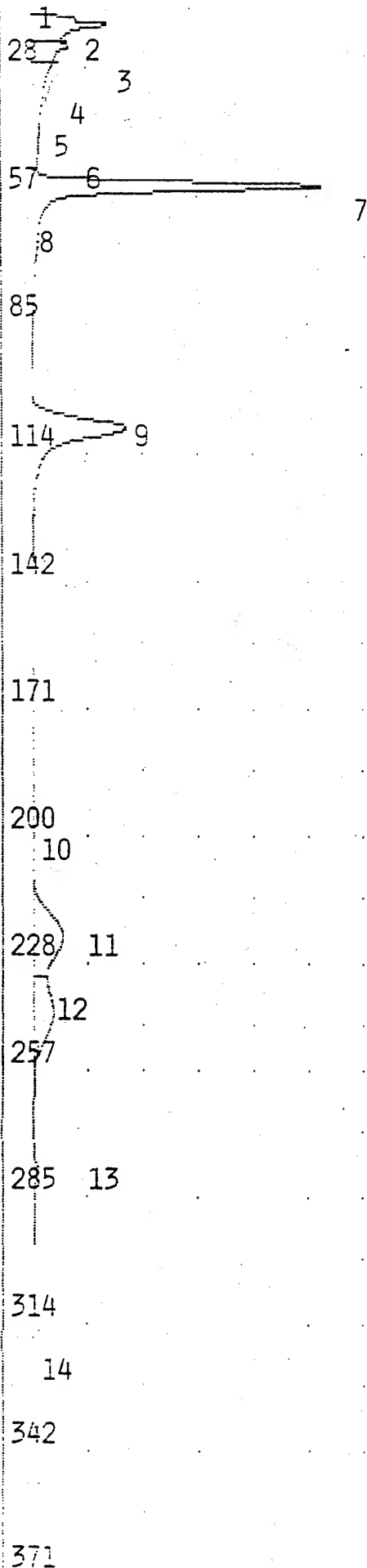
SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000
ANALYSIS TIME 400.0 SEC

PEAK REPORT

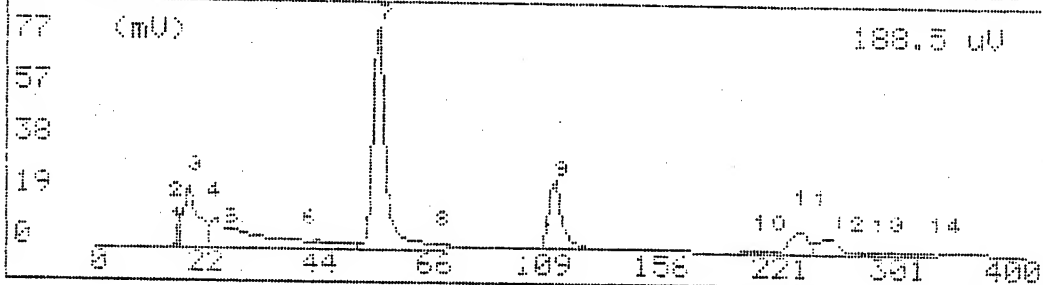
PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.056 MVS	13.8
2	UNKNOWN	12.71 MVS	15.4
3	UNKNOWN	61.14 MVS	16.9
4	UNKNOWN	107.9 MVS	22.0
5	UNKNOWN	0.194 MVS	26.0
6	UNKNOWN	1.020 MVS	40.4
7	BENZENE	108.4 PPB	53.0
8	UNKNOWN	1.131 MVS	66.0
9	TOLUENE	94.77 PPB	106.5
10	UNKNOWN	8.266 MVS	197.2
11	ETHYLBENZENE	100.7 PPB	220.8
12	M,P-XYLENE	214.4 PPB	237.2
13	O-XYLENE	143.7 PPB	278.4
14	UNKNOWN	0.912 MVS	318.9

NOTES

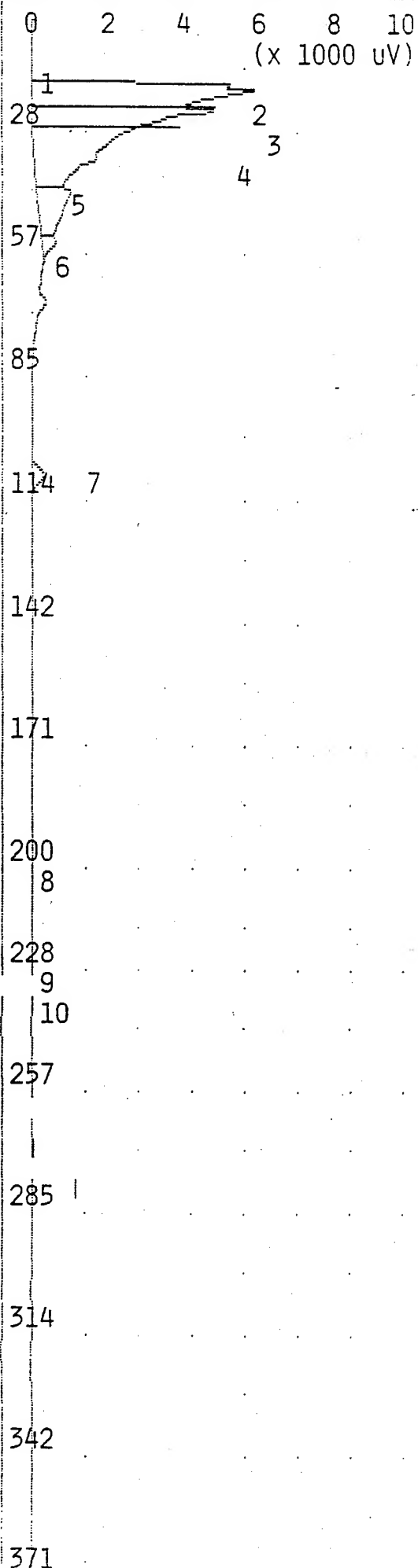
JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX



S.C. Keeney		1057	GC Function	10	11	12	13	14	15
Analysis No 17		Run at		10.00	11.00	12.00	13.00	14.00	15.00
Py No	Name	Conc	Area	Term	Ret.	Time			
1	Unknown	1.3228	ml/g	-No-	4.0	sec			
2	Benzene	1.0000	ppm	-No-	5.0	sec			
3	Unknown	1.0000	ppm	-No-	6.0	sec			
4	Toluene	1.0000	ppm	-No-	7.0	sec			
5	Unknown	1.0000	ppm	-No-	8.0	sec			
6	Ethylbenzene	1.0000	ppm	-No-	9.0	sec			
7	m,p-xylene	1.0000	ppm	-No-	10.0	sec			
8	o-xylene	1.0000	ppm	-No-	11.0	sec			
9	Unknown	0.0122	ml/g	-No-	12.0	sec			
- Detected 14 peaks. Use + + to scroll					13.0	sec			



ANALYSIS #18 10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 13,95 12:17

SAMPLE TIME: MAY 13,95 12:10

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000
ANALYSIS TIME 400.0 SEC

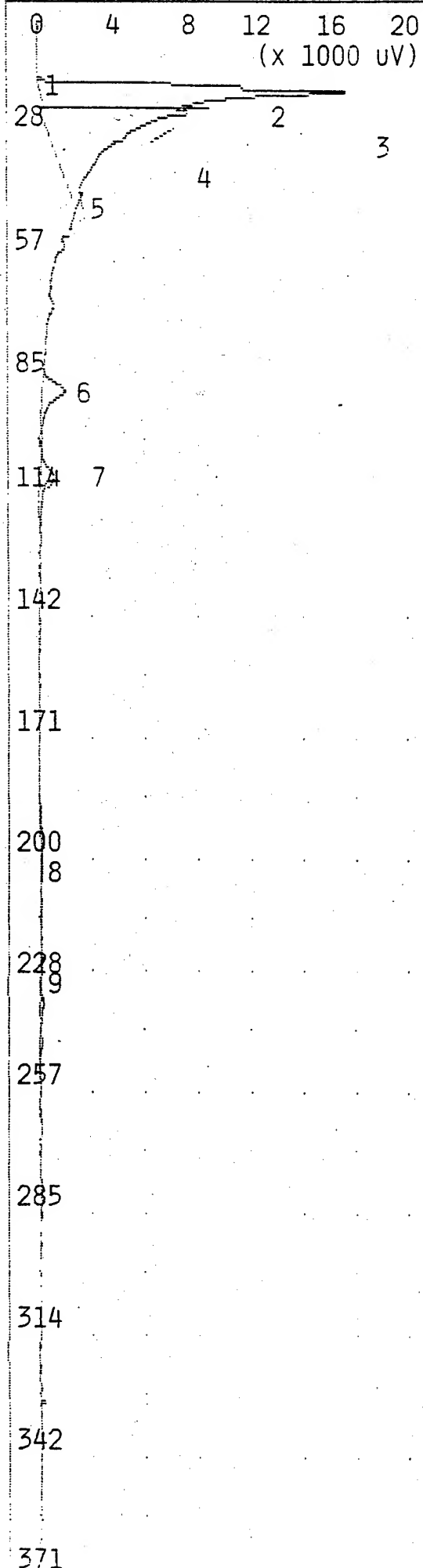
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.162 MVS	14.0
2	UNKNOWN	5.943 MVS	15.5
3	UNKNOWN	24.13 MVS	16.8
4	UNKNOWN	41.35 MVS	21.8
5	UNKNOWN	7.231 MVS	41.0
6	BENZENE	0.516 PPB	52.4
7	TOLUENE	1.721 PPB	106.9
8	UNKNOWN	1.523 MVS	197.0
9	ETHYLBENZENE	0.947 PPB	228.4
10	M,P-XYLENE	2.371 PPB	235.4

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK

ANALYSIS #19 10S+ GC FUNCTION ANALYSIS REPORT

TIME PRINTED: MAY 13,95 12:27
SAMPLE TIME: MAY 13,95 12:21

METHOD

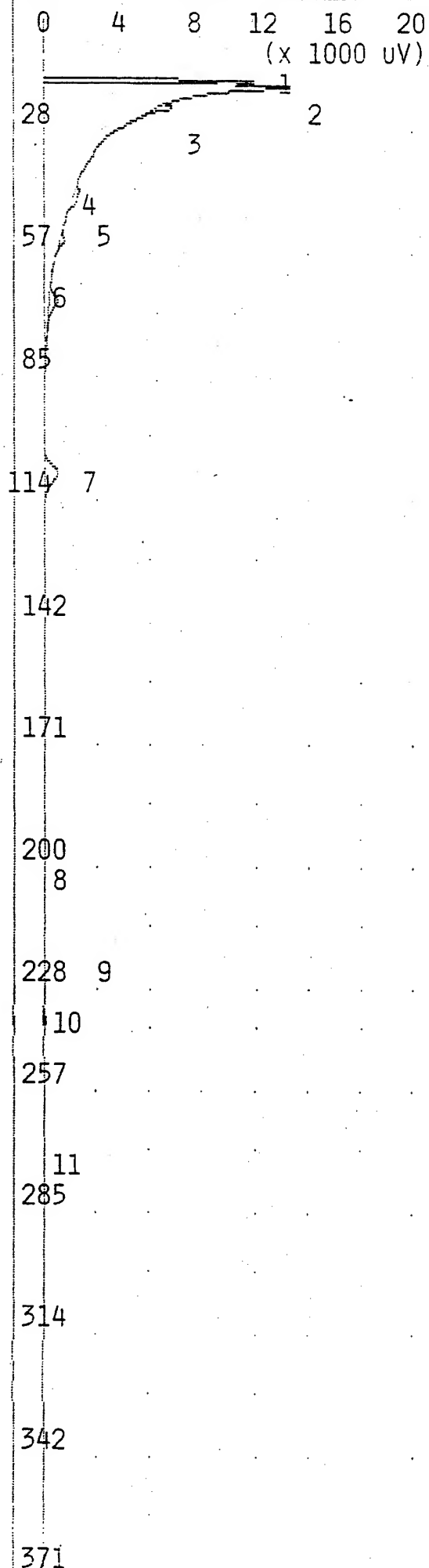
SLOPE UP 1.000 MV/SEC
SLOPE DOWN 3.000 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 32 C
MAX GAIN 1000
ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.392 MVS	14.1
2	UNKNOWN	11.99 MVS	15.4
3	UNKNOWN	107.8 MVS	16.8
4	UNKNOWN	1.300 MVS	21.9
5	UNKNOWN	0.212 MVS	40.7
6	UNKNOWN	5.854 MVS	86.4
7	TOLUENE	3.075 PPB	106.8
8	UNKNOWN	0.903 MVS	200.8
9	ETHYLBENZENE	2.494 PPB	228.4

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-008BH
13.0-15.0 10G



TIME PRINTED: MAY 13, 95 12:37

SAMPLE TIME: MAY 13, 95 12:31

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 32 C
MAX GAIN 1000
ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	13.18 MVS	14.8
2	UNKNOWN	144.0 MVS	16.3
3	UNKNOWN	1.143 MVS	21.3
4	UNKNOWN	0.577 MVS	40.9
5	BENZENE	0.124 PPB	52.3
6	UNKNOWN	1.633 MVS	66.1
7	TOLUENE	3.441 PPB	106.2
8	UNKNOWN	7.815 MVS	196.4
9	ETHYLBENZENE	7.276 PPB	220.4
10	M,P-XYLENE	16.50 PPB	237.4
11	O-XYLENE	8.636 PPB	273.6

NOTES

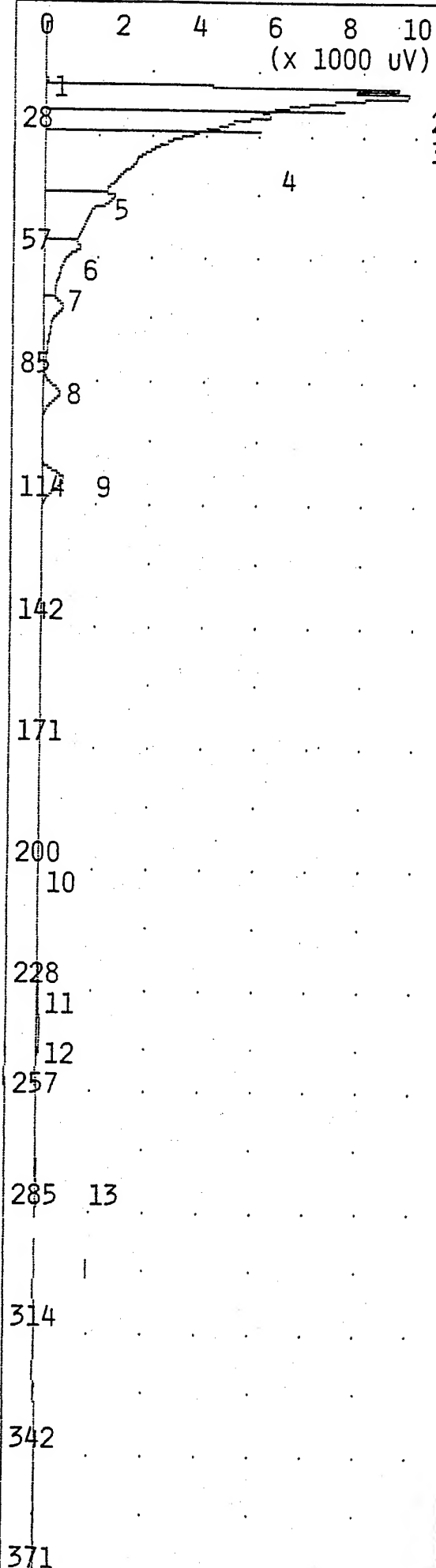
JOE BYRD, JR.

DULUTH ANGB

025-010BH

0.5- 2.5 10G

ANALYSIS #21 10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 13, 95 12:49
 SAMPLE TIME: MAY 13, 95 12:42

METHOD

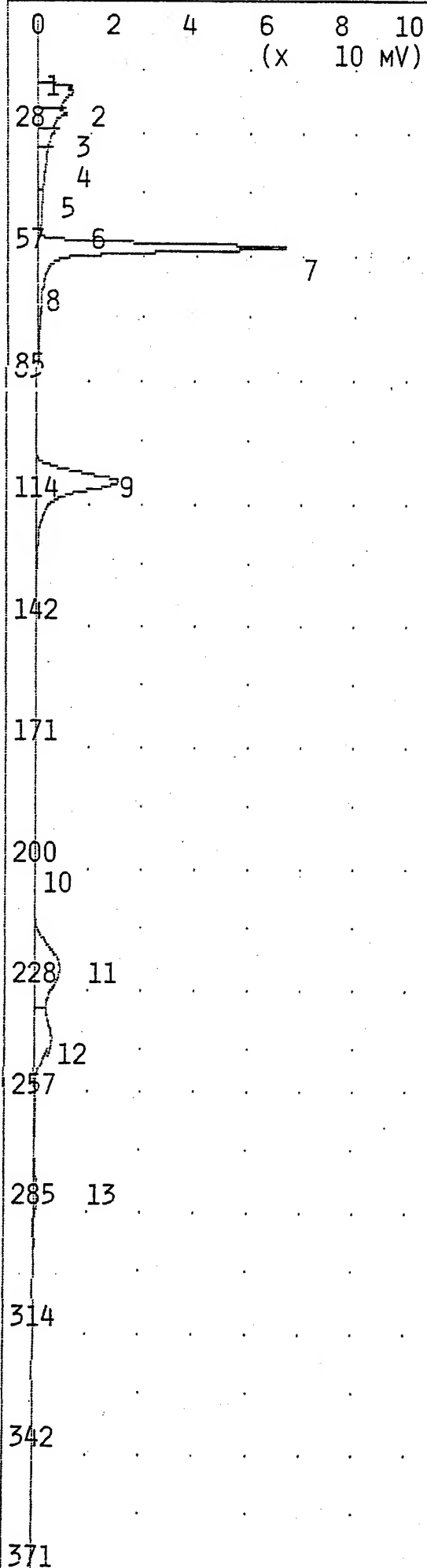
SLOPE UP 0.500 MV/SEC
 SLOPE DOWN 1.500 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 14 ML/MIN
 B/F FLOW 14 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 32 C
 MAX GAIN 1000
 ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.191 MVS	13.9
2	UNKNOWN	11.09 MVS	15.5
3	UNKNOWN	39.59 MVS	17.0
4	UNKNOWN	61.22 MVS	22.0
5	UNKNOWN	16.12 MVS	40.9
6	BENZENE	3.302 PPB	52.9
7	UNKNOWN	5.111 MVS	66.1
8	UNKNOWN	3.420 MVS	86.5
9	TOLUENE	2.678 PPB	107.0
10	UNKNOWN	1.370 MVS	199.2
11	ETHYLBENZENE	1.206 PPB	226.2
12	M,P-XYLENE	2.937 PPB	238.6
13	O-XYLENE	1.854 PPB	276.5

NOTES

JOE BYRD, JR.
 DULUTH ANGB
 025-010BH
 5.0- 7.0 10G



TIME PRINTED: MAY 13,95 14:11

SAMPLE TIME: MAY 13,95 14:04

METHOD

SLOPE UP 0.500 MV/SEC
 SLOPE DOWN 1.500 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 14 ML/MIN
 B/F FLOW 14 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 ΔMB TEMP 32 C
 MAX GAIN 1000
 ANALYSIS TIME 400.0 SEC

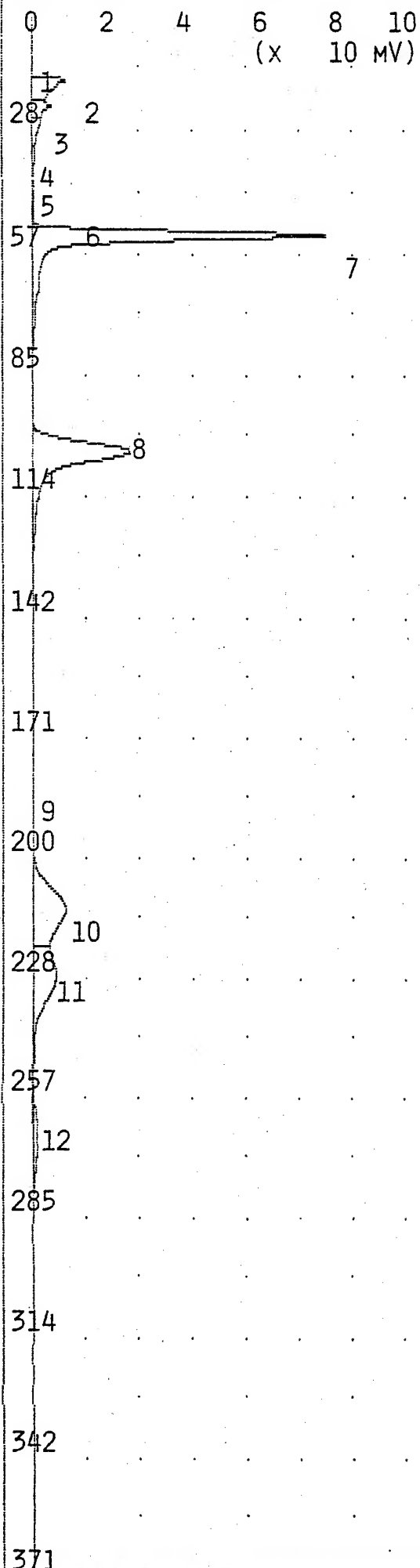
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.042 MVS	14.0
2	UNKNOWN	10.70 MVS	15.5
3	UNKNOWN	38.65 MVS	17.0
4	UNKNOWN	26.49 MVS	22.1
5	UNKNOWN	40.37 MVS	26.0
6	UNKNOWN	12.84 MVS	40.8
7	BENZENE	92.50 PPB	53.1
8	UNKNOWN	0.126 MVS	66.1
9	TOLUENE	91.84 PPB	106.8
10	UNKNOWN	3.060 MVS	197.4
11	ETHYLBENZENE	95.59 PPB	221.8
12	M,P-XYLENE	192.6 PPB	238.2
13	O-XYLENE	100.5 PPB	279.2

NOTES

JOE BYRD, JR.
 DULUTH ANGB
 100 PPB BTEX

ANALYSIS #1 10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 15,95 08:18

SAMPLE TIME: MAY 15,95 08:12

METHOD

SLOPE UP 0.500 MV/SEC
 SLOPE DOWN 1.500 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 14 ML/MIN
 B/F FLOW 14 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 29 C
 MAX GAIN 1000
 ANALYSIS TIME 400.0 SEC

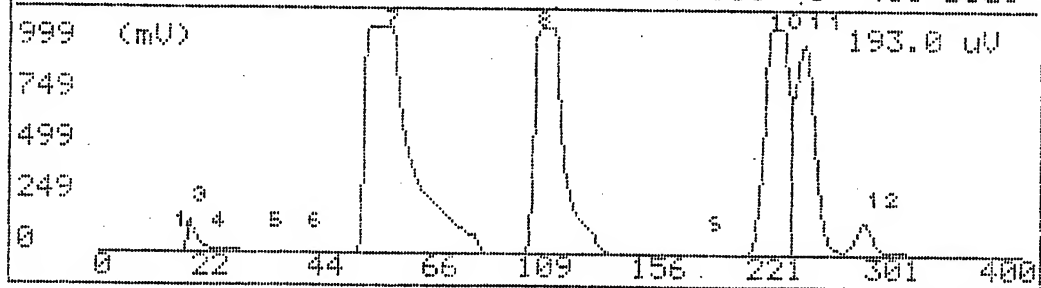
PEAK REPORT

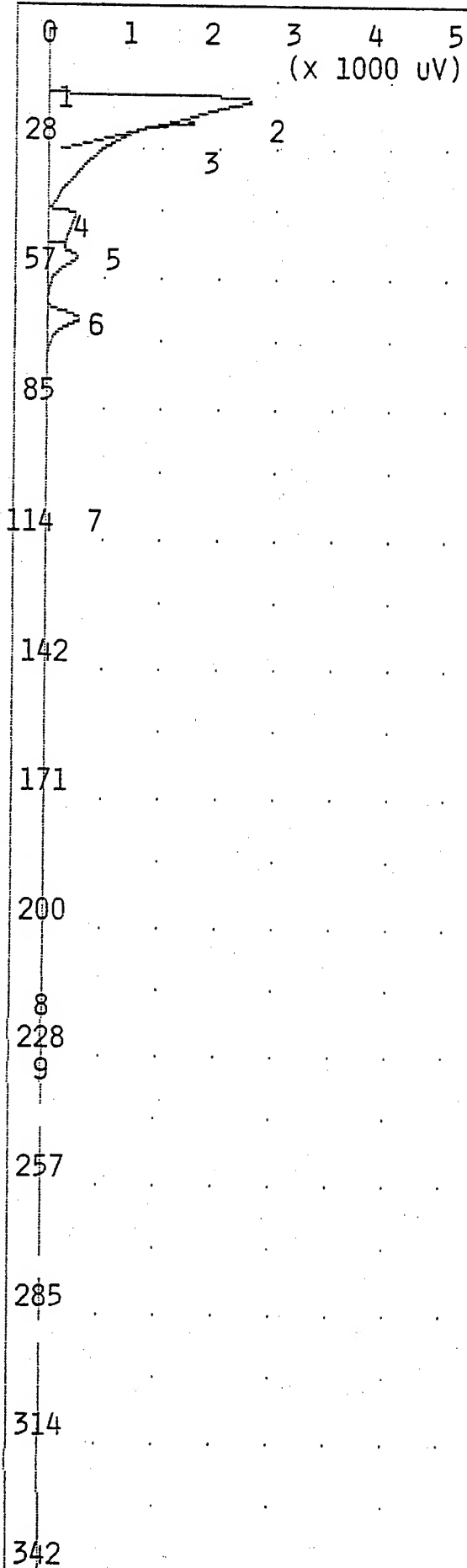
PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.084 MVS	13.2
2	UNKNOWN	36.63 MVS	14.7
3	UNKNOWN	16.31 MVS	21.0
4	UNKNOWN	12.82 MVS	24.8
5	UNKNOWN	7.370 MVS	31.0
6	UNKNOWN	4.747 MVS	41.1
7	UNKNOWN	233.6 MVS	50.8
8	UNKNOWN	168.8 MVS	101.6
9	UNKNOWN	2.133 MVS	187.0
10	UNKNOWN	114.5 MVS	210.0
11	UNKNOWN	85.61 MVS	225.8
12	UNKNOWN	22.68 MVS	265.3

NOTES

JOE BYRD, JR.
 DULUTH ANGB
 100 PPB BTEX

G.C. Ready		10S+ GC Function	May 15, 95	09:10
-- Analysis No 3		-- Run at --	May 15, 95	08:55
Pk No	Name	Conc/Area	Alarm	Ret. Time
4	Unknown	4.020 mUS	-No-	21.1 sec
5	Unknown	0.875 mUS	-No-	33.7 sec
6	Unknown	0.151 mUS	-No-	38.4 sec
7	benzene	10.00 ppm	-No-	52.2 sec
8	toluene	10.00 ppm	-No-	103.2 sec
9	Unknown	5.065 mUS	-No-	182.6 sec
10	ethylbenzene	10.00 ppm	-No-	212.4 sec
11	m,p-xylene	20.00 ppm	-No-	227.4 sec
12	o-xylene	10.02 ppm	-No-	266.6 sec
- Detected 12 peaks. Use + + to scroll [485 sec]				





TIME PRINTED: MAY 15,95 09:18

SAMPLE TIME: MAY 15,95 09:12

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 29 C
MAX GAIN 1000
ANALYSIS TIME 400.0 SEC

PEAK REPORT

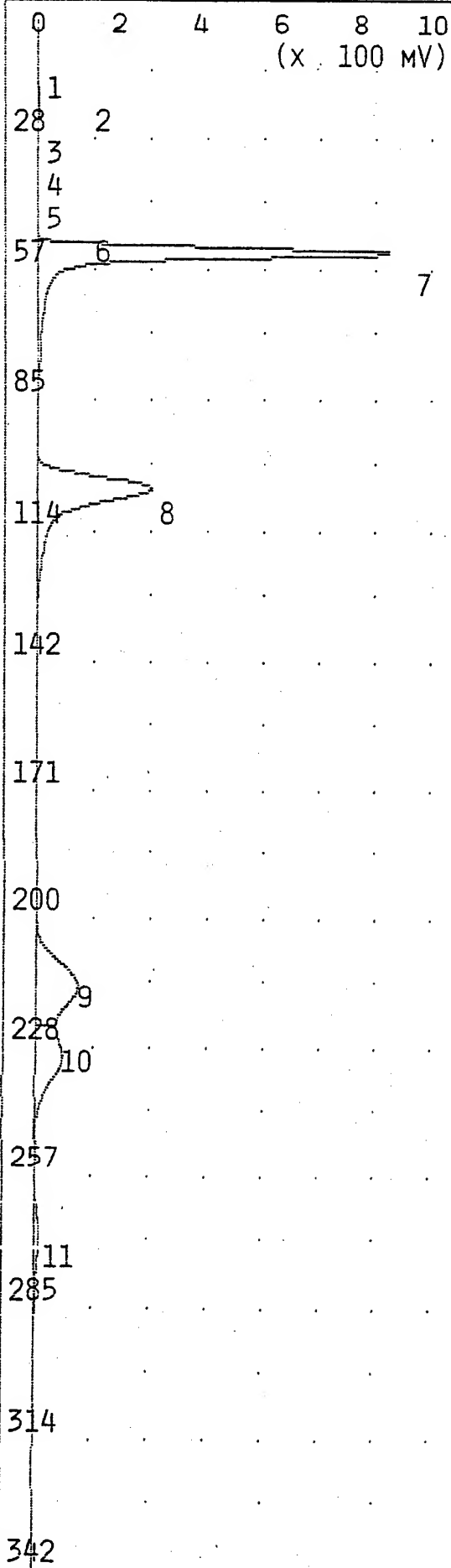
PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.080 MVS	13.5
2	UNKNOWN	29.12 MVS	16.1
3	UNKNOWN	0.246 MVS	20.8
4	UNKNOWN	3.645 MVS	41.8
5	BENZENE	1.693 PPB	50.8
6	UNKNOWN	4.391 MVS	63.9
7	TOLUENE	0.895 PPB	102.4
8	ETHYLBENZENE	3.152 PPB	211.2
9	M,P-XYLENE	4.396 PPB	227.4

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK

ANALYSIS #5

10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 15, 95 11:10

SAMPLE TIME: MAY 15, 95 11:03

METHOD

SLOPE UP 0.500 MV/SEC
 SLOPE DOWN 1.500 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 14 ML/MIN
 B/F FLOW 14 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 28 C
 MAX GAIN 1000
 ANALYSIS TIME 400.0 SEC

PEAK REPORT

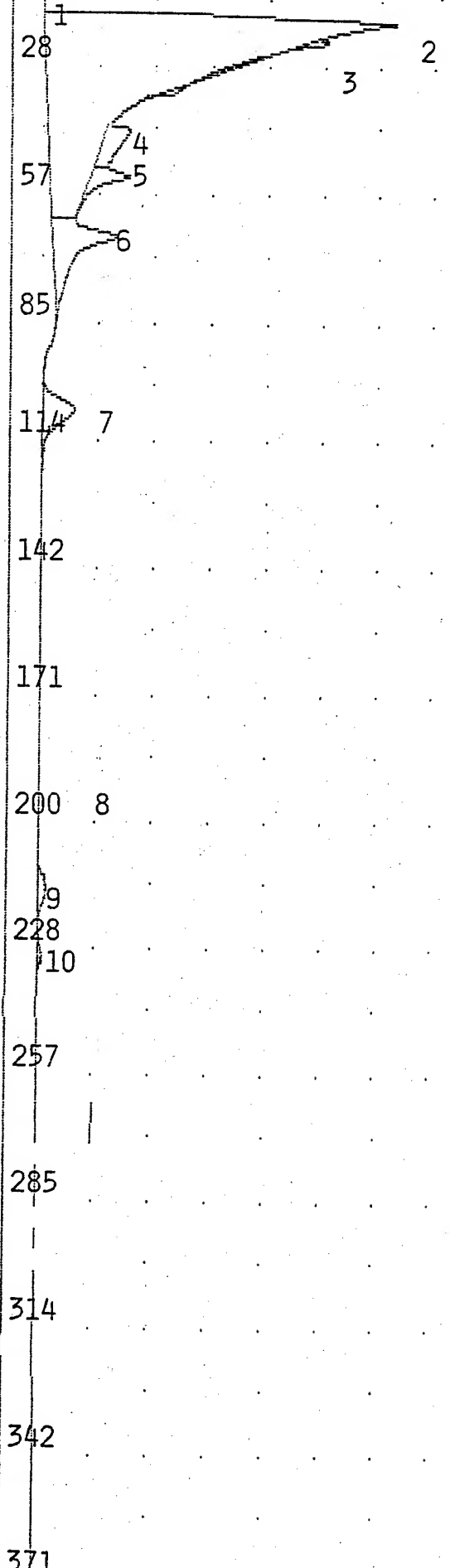
PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.042 MVS	13.2
2	UNKNOWN	3.328 MVS	15.1
3	UNKNOWN	18.02 MVS	16.6
4	UNKNOWN	42.86 MVS	21.3
5	UNKNOWN	0.498 MVS	25.2
6	UNKNOWN	0.852 MVS	40.8
7	BENZENE	827.2 PPB	51.6
8	TOLUENE	778.3 PPB	103.0
9	ETHYLBENZENE	664.2 PPB	213.0
10	M,P-XYLENE	1.304 PPM	228.8
11	O-XYLENE	631.7 PPB	268.5

NOTES

JOE BYRD, JR.
 DULUTH ANGB
 1 PPM BTEX

ANALYSIS #6

10S+ GC FUNCTION ANALYSIS REPORT

0 1 2 3 4 5
(x 1000 uV)TIME PRINTED: MAY 15, 95 11:23
SAMPLE TIME: MAY 15, 95 11:17

METHOD

SLOPE UP	0.500	MV/SEC
SLOPE DOWN	1.500	MV/SEC
MIN AREA	0.000	MVSEC
MIN HEIGHT	0.000	MV
ANALYSIS DELAY	0.0	SEC
WINDOW PERCENT	10.0	%
DET. FLOW	14	ML/MIN
B/F FLOW	14	ML/MIN
AUX FLOW	0	ML/MIN
OVEN TEMP	40	C
AMB TEMP	28	C
MAX GAIN	1000	
ANALYSIS TIME	400.0	SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.030 MVS	13.3
2	UNKNOWN	74.80 MVS	16.6
3	UNKNOWN	0.021 MVS	21.2
4	UNKNOWN	2.117 MVS	41.1
5	BENZENE	0.690 PPB	51.3
6	UNKNOWN	5.865 MVS	64.6
7	TOLUENE	1.606 PPB	103.3
8	UNKNOWN	1.127 MVS	191.0
9	ETHYLBENZENE	2.951 PPB	212.6
10	M,P-XYLENE	3.487 PPB	229.8

NOTES

JOE BYRD, JR.
DULUTH ANGB

1 PPM BTEX

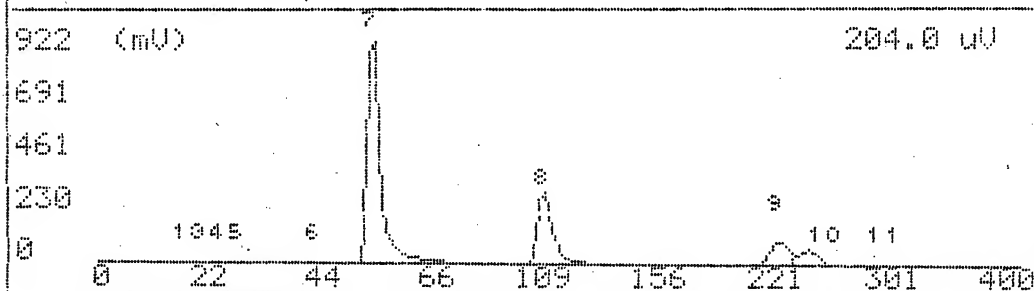
AIR BLANK

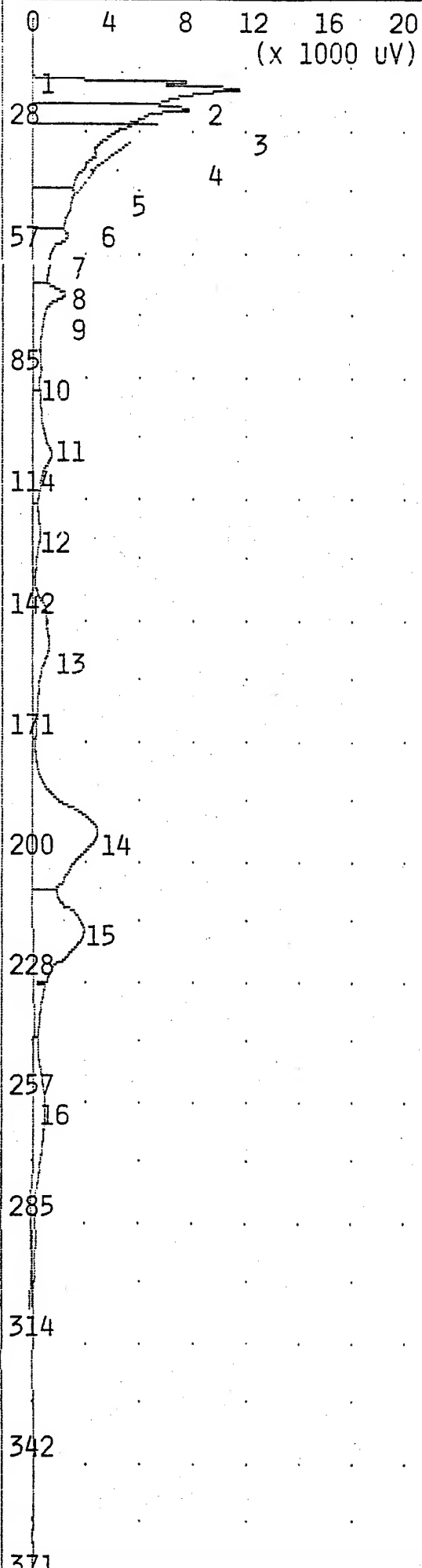
JB

G.C. Ready 10S+ GC Function May 15, 95 11:15
 -- Analysis No 5 -- Run at - May 15, 95 11:03 -

PK No	Name	Conc/Area	Alarm	Ret. Time
3	Unknown	18.02 mUS	-No-	16.6 sec
4	Unknown	42.93 mUS	-No-	21.3 sec
5	Unknown	0.498 mUS	-No-	25.2 sec
6	Unknown	0.852 mUS	-No-	40.8 sec
7	benzene	1.000 ppm	-No-	51.6 sec
8	toluene	1.000 ppm	-No-	103.0 sec
9	ethylbenzene	1.000 ppm	-No-	213.0 sec
10	m,p-xylene	2.000 ppm	-No-	228.0 sec
11	o-xylene	1.000 ppm	-No-	268.5 sec

- Detected 11 peaks. Use + + to scroll [405 sec]





TIME PRINTED: MAY 15,95 11:33

SAMPLE TIME: MAY 15,95 11:27

METHOD

SLOPE UP 0.500 MV/SEC
 SLOPE DOWN 1.500 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 14 ML/MIN
 B/F FLOW 14 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 29 C
 MAX GAIN 1000
 ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.330 MVS	13.6
2	UNKNOWN	9.082 MVS	15.0
3	UNKNOWN	41.66 MVS	16.5
4	UNKNOWN	82.39 MVS	21.4
5	UNKNOWN	0.263 MVS	25.2
6	UNKNOWN	0.682 MVS	32.0
7	UNKNOWN	19.93 MVS	40.8
8	BENZENE	6.523 PPB	51.2
9	UNKNOWN	18.73 MVS	64.2
10	UNKNOWN	0.008 MVS	81.7
11	TOLUENE	9.838 PPB	101.8
12	UNKNOWN	5.590 MVS	120.0
13	UNKNOWN	18.84 MVS	147.0
14	UNKNOWN	60.17 MVS	191.0
15	ETHYLBENZENE	40.92 PPB	214.4
16	O-XYLENE	82.13 PPB	257.3

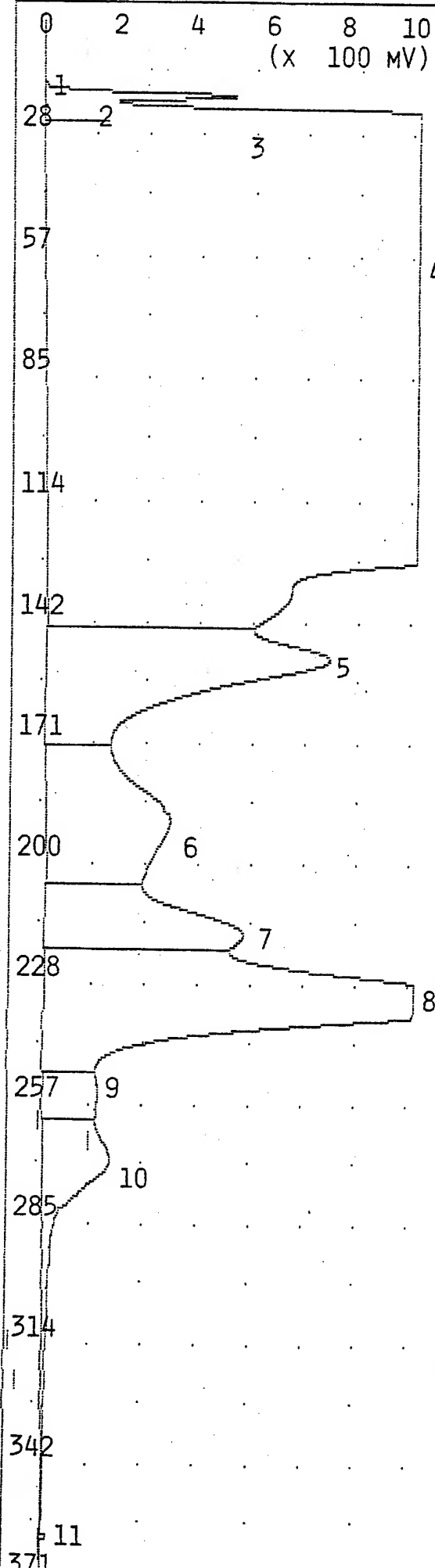
NOTES

JOE BYRD, JR.

DULUTH ANGB

025-003BH

0.5- 2.5 10G



TIME PRINTED: MAY 15, 95 11:44

SAMPLE TIME: MAY 15, 95 11:37

METHOD

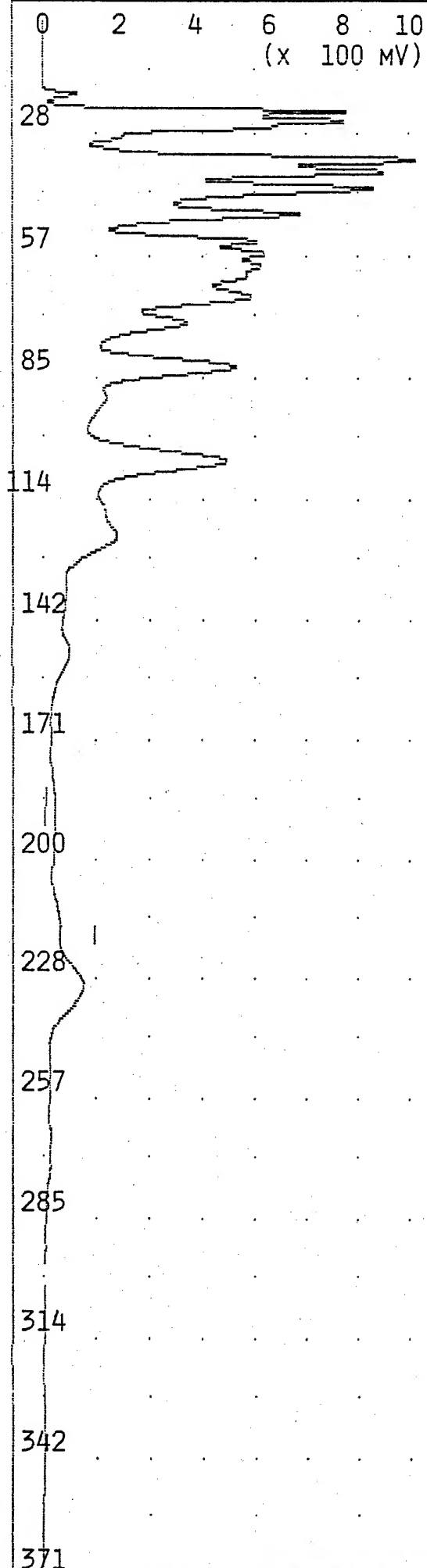
SLOPE UP 0.500 MV/SEC
 SLOPE DOWN 1.500 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 14 ML/MIN
 B/F FLOW 14 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 29 C
 MAX GAIN 1000
 ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.903 MVS	14.0
2	UNKNOWN	6.847 MVS	15.0
3	UNKNOWN	1.065 VSEC	17.8
4	UNKNOWN	3694. VSEC	58.0
5	UNKNOWN	12.53 VSEC	149.4
6	UNKNOWN	8.940 VSEC	188.2
7	ETHYLBENZENE	3.621 PPM	214.6
8	M,P-XYLENE	35.65 PPM	230.2
9	UNKNOWN	1.673 VSEC	252.2
10	O-XYLENE	15.05 PPM	268.2
11	UNKNOWN	61.29 MVS	358.6

NOTES

JOE BYRD, JR.
 DULUTH ANGB
 025-003BH
 5.0- 7.0 10G



TIME PRINTED: MAY 15, 95 11:55

SAMPLE TIME: MAY 15, 95 11:49

METHOD

SLOPE UP 0.500 MV/SEC

SLOPE DOWN 1.500 MV/SEC

MIN AREA 0.000 MVSEC

MIN HEIGHT 0.000 MV

ANALYSIS DELAY 0.0 SEC

WINDOW PERCENT 10.0 %

DET FLOW 14 ML/MIN

B/F FLOW 14 ML/MIN

AUX FLOW 0 ML/MIN

OVEN TEMP 40 C

AMB TEMP 29 C

MAX GAIN 1000

ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK COMPOUND NAME AREA/CONC R.T.

NOTES

JOE BYRD, JR.

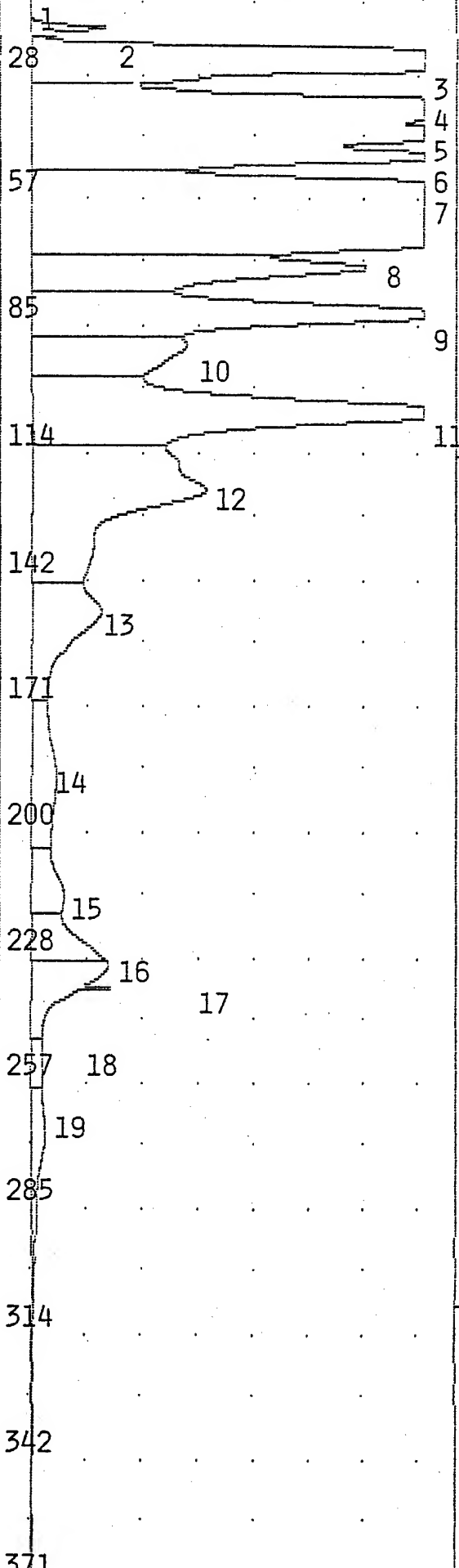
DULUTH ANGB

025-003BH RESHOT

5.0- 7.0 10G

10 MICROLITER INJECTION

0 2 4 6 8 10
(x 100 MV)



TIME PRINTED: MAY 15,95 12:08

SAMPLE TIME: MAY 15,95 12:01

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 30 C
MAX GAIN 1000
ANALYSIS TIME 400.0 SEC

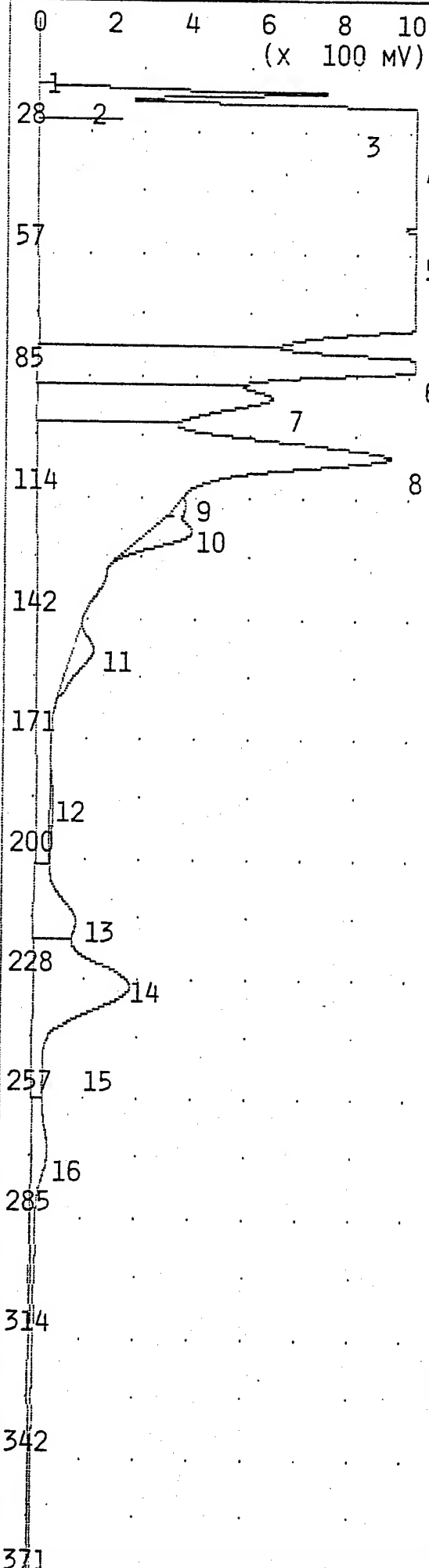
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.276 MVS	13.6
2	UNKNOWN	329.3 MVS	17.4
3	UNKNOWN	18.56 VSEC	23.3
4	UNKNOWN	14.87 VSEC	34.4
5	UNKNOWN	5.542 VSEC	39.8
6	UNKNOWN	5.542 VSEC	45.4
7	UNKNOWN	77.85 VSEC	57.9
8	UNKNOWN	5.012 VSEC	70.6
9	UNKNOWN	7.924 VSEC	81.0
10	UNKNOWN	3.185 VSEC	88.2
11	TOLUENE	4.792 PPM	103.2
12	UNKNOWN	8.105 VSEC	120.5
13	UNKNOWN	2.722 VSEC	148.0
14	UNKNOWN	1.677 VSEC	185.8
15	ETHYLBENZENE	747.1 PPB	212.6
16	M,P-XYLENE	2.743 PPM	227.8
17	UNKNOWN	1.656 VSEC	233.6
18	UNKNOWN	305.3 MVS	250.9
19	O-XYLENE	4.034 PPM	266.4

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-003BH RE-RESHO
5.0- 7.0 10G
20 MICROLITER INJECTION

ANALYSIS #11 10S+ GC FUNCTION ANALYSIS REPORT

TIME PRINTED: MAY 15,95 12:21
SAMPLE TIME: MAY 15,95 12:15

METHOD

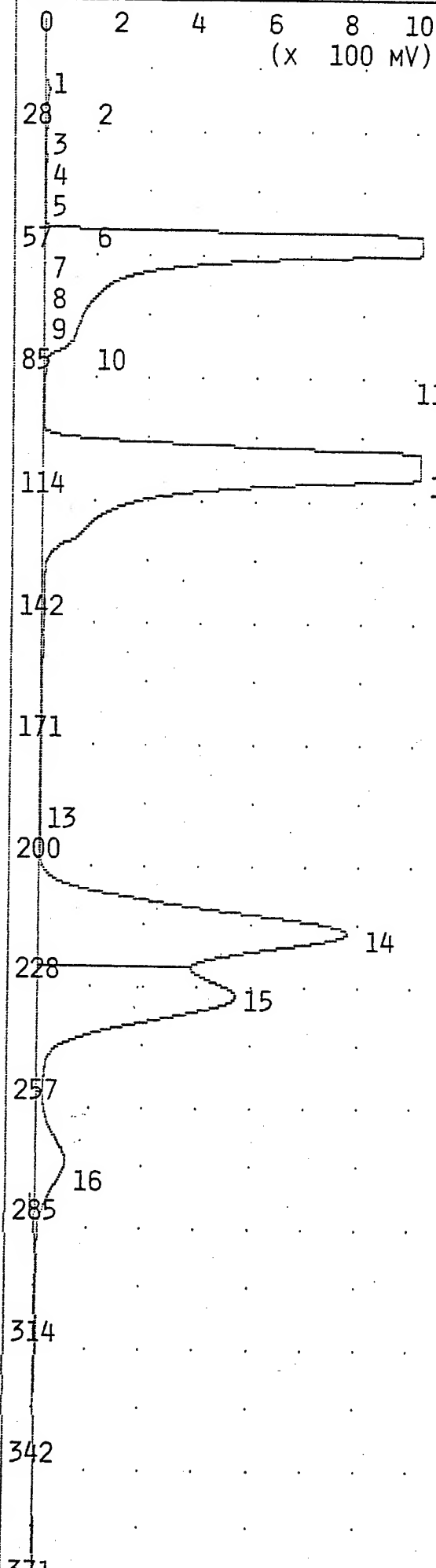
SLOPE UP	0.500	MV/SEC
SLOPE DOWN	1.500	MV/SEC
MIN AREA	0.000	MVSEC
MIN HEIGHT	0.000	MV
ANALYSIS DELAY	0.0	SEC
WINDOW PERCENT	10.0	%
DET FLOW	14	ML/MIN
B/F FLOW	14	ML/MIN
AUX FLOW	0	ML/MIN
OVEN TEMP	40	C
AMB TEMP	30	C
MAX GAIN	1000	
ANALYSIS TIME	400.0	SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.666 MVS	13.7
2	UNKNOWN	3.453 MVS	14.6
3	UNKNOWN	1.461 VSEC	17.5
4	UNKNOWN	256.3 VSEC	34.5
5	UNKNOWN	53.70 VSEC	59.2
6	UNKNOWN	9.080 VSEC	81.0
7	UNKNOWN	4.846 VSEC	88.8
8	TOLUENE	9.510 PPM	102.5
9	UNKNOWN	107.9 MVS	114.1
10	UNKNOWN	688.4 MVS	120.1
11	UNKNOWN	536.7 MVS	148.2
12	UNKNOWN	92.82 MVS	184.8
13	ETHYLBENZENE	1.044 PPM	212.8
14	M,P-XYLENE	7.292 PPM	228.2
15	UNKNOWN	0.840 MVS	249.8
16	O-XYLENE	5.399 PPM	267.4

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-003BH
10.0-12.0 10G
20 MICROLITER INJECTION



TIME PRINTED: MAY 15,95 12:36

SAMPLE TIME: MAY 15,95 12:29

METHOD

SLOPE UP 0.500 MV/SEC
 SLOPE DOWN 1.500 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 14 ML/MIN
 B/F FLOW 14 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 30 C
 MAX GAIN 1000
 ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.034 MVS	13.4
2	UNKNOWN	9.058 MVS	15.2
3	UNKNOWN	52.39 MVS	16.6
4	UNKNOWN	28.07 MVS	21.6
5	UNKNOWN	16.67 MVS	23.8
6	UNKNOWN	33.21 MVS	25.4
7	UNKNOWN	23.63 MVS	32.6
8	UNKNOWN	17.08 MVS	35.4
9	UNKNOWN	27.79 MVS	39.2
10	UNKNOWN	17.45 MVS	45.2
11	BENZENE	8.717 PPM	52.6
12	TOLUENE	8.469 PPM	104.1
13	UNKNOWN	2.660 MVS	183.0
14	ETHYLBENZENE	5.511 PPM	213.8
15	M,P-XYLENE	11.62 PPM	228.6
16	O-XYLENE	5.805 PPM	268.0

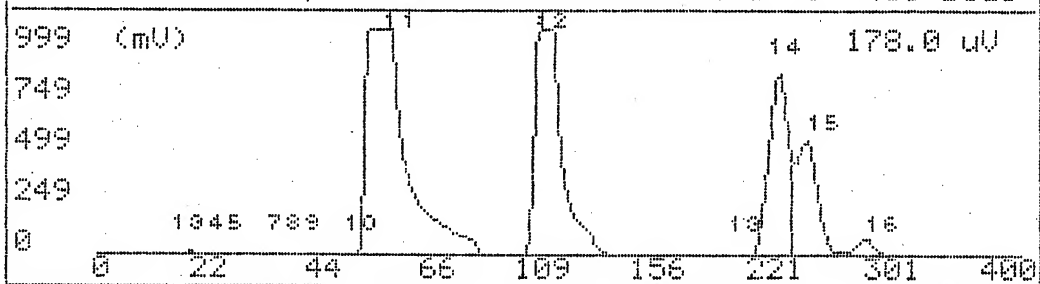
NOTES

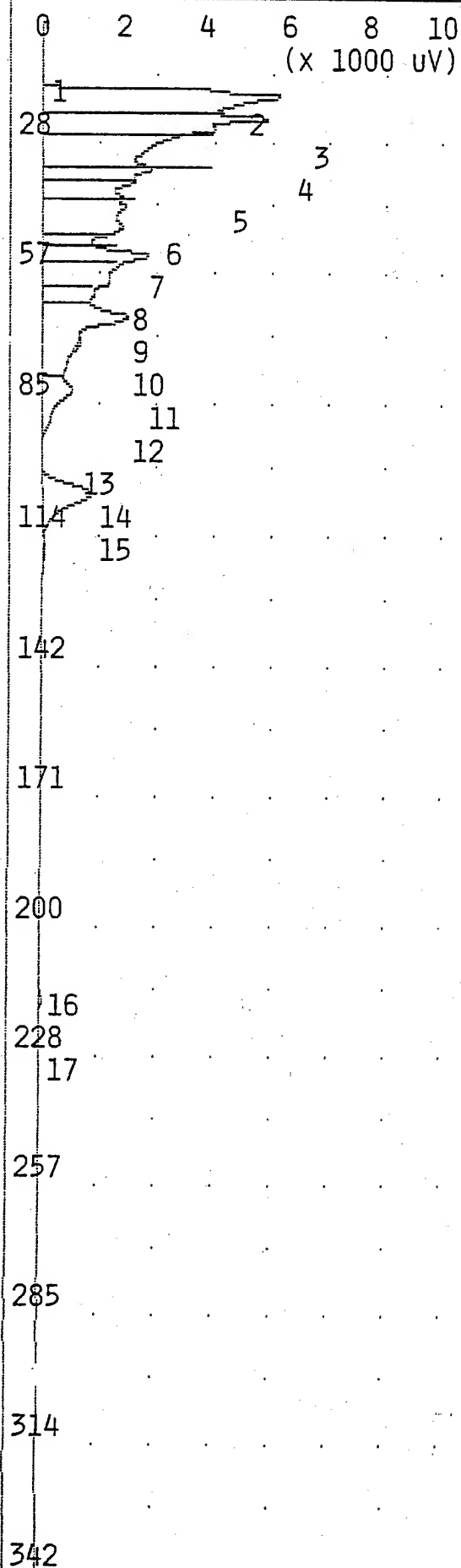
JOE BYRD, JR.
 DULUTH ANGB
 10 PPM BTEX

G.C. Ready 108+ GC Function May 15, 95 12:41
 -- Analysis No 12 -- Run at -- May 15, 95 12:29 --

Pk No	Name	Conc/Area	Alarm	Ret. Time
8	Unknown	17.10 mUS	-No-	35.4 sec
9	Unknown	27.84 mUS	-No-	39.2 sec
10	Unknown	17.49 mUS	-No-	45.2 sec
11	benzene	10.00 ppm	-No-	52.6 sec
12	toluene	10.00 ppm	-No-	104.1 sec
13	Unknown	2.660 mUS	-No-	183.0 sec
14	ethylbenzene	10.00 ppm	-No-	213.0 sec
15	m,p-xylene	20.00 ppm	-No-	228.6 sec
16	o-xylene	10.03 ppm	-No-	268.0 sec

- Detected 16 peaks. Use + + to scroll [405 sec]





TIME PRINTED: MAY 15,95 12:50

SAMPLE TIME: MAY 15,95 12:43

METHOD

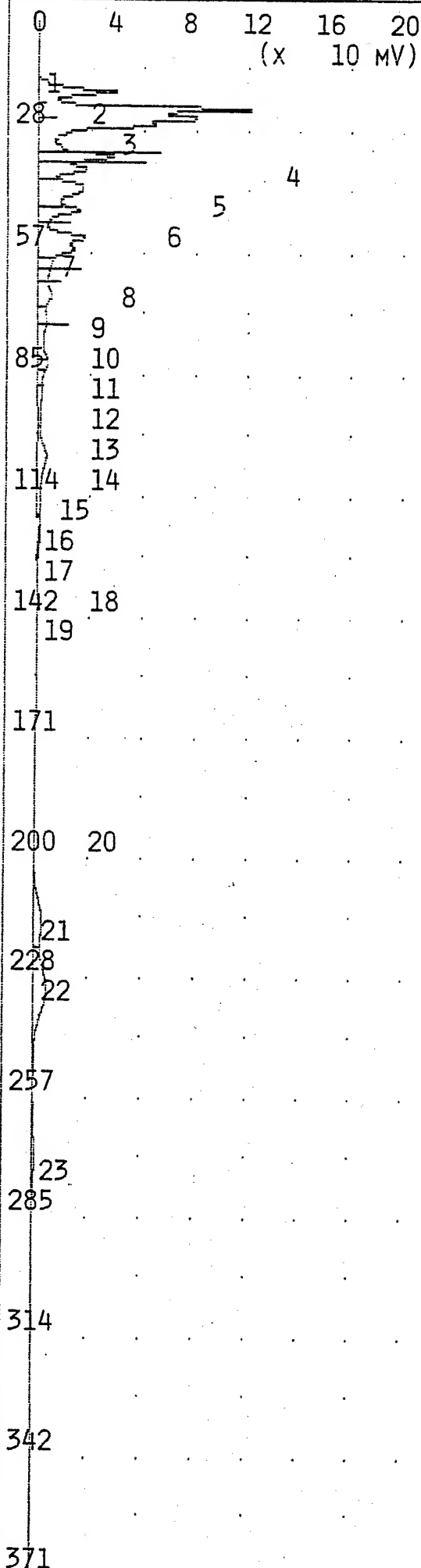
SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 30 C
MAX GAIN 1000
ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.235 MVS	13.6
2	UNKNOWN	4.557 MVS	15.2
3	UNKNOWN	24.47 MVS	16.4
4	UNKNOWN	15.12 MVS	21.4
5	UNKNOWN	25.13 MVS	23.8
6	UNKNOWN	10.78 MVS	32.4
7	UNKNOWN	6.933 MVS	35.4
8	UNKNOWN	5.087 MVS	39.0
9	UNKNOWN	8.078 MVS	40.8
10	UNKNOWN	10.13 MVS	45.4
11	BENZENE	10.50 PPB	51.4
12	UNKNOWN	20.04 MVS	64.5
13	UNKNOWN	0.209 MVS	70.5
14	UNKNOWN	7.013 MVS	81.0
15	TOLUENE	5.070 PPB	103.4
16	ETHYLBENZENE	10.61 PPB	214.8
17	M,P-XYLENE	25.08 PPB	229.6

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK



TIME PRINTED: MAY 15, 95 13:02
 SAMPLE TIME: MAY 15, 95 12:55

METHOD

SLOPE UP 0.500 MV/SEC
 SLOPE DOWN 1.500 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 14 ML/MIN
 B/F FLOW 14 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 30 C
 MAX GAIN 1000
 ANALYSIS TIME 400.0 SEC

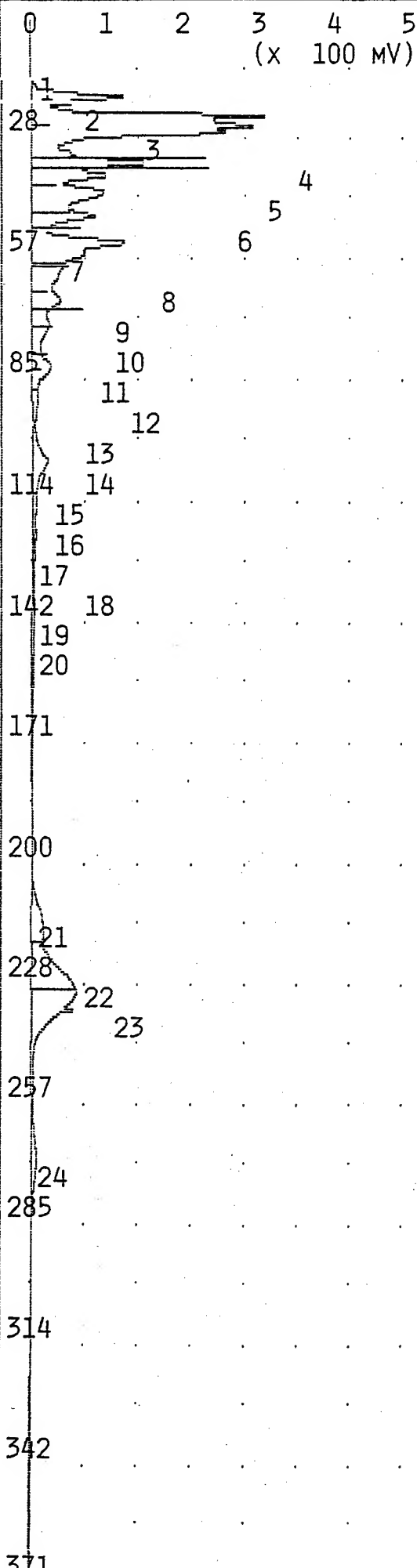
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.265 MVS	13.7
2	UNKNOWN	4.559 MVS	14.8
3	UNKNOWN	85.55 MVS	17.5
4	UNKNOWN	191.6 MVS	21.4
5	UNKNOWN	170.6 MVS	23.8
6	UNKNOWN	118.8 MVS	25.3
7	UNKNOWN	19.67 MVS	30.2
8	UNKNOWN	98.63 MVS	32.5
9	UNKNOWN	67.94 MVS	35.6
10	UNKNOWN	45.24 MVS	39.5
11	UNKNOWN	55.97 MVS	40.5
12	UNKNOWN	77.21 MVS	45.2
13	BENZENE	28.22 PPB	51.4
14	UNKNOWN	89.39 MVS	54.2
15	UNKNOWN	40.05 MVS	64.8
16	UNKNOWN	34.25 MVS	70.6
17	UNKNOWN	53.57 MVS	80.6
18	TOLUENE	42.57 PPB	103.0
19	UNKNOWN	2.261 MVS	119.6
20	UNKNOWN	0.776 MVS	190.2
21	ETHYLBENZENE	40.78 PPB	213.6
22	M,P-XYLENE	228.3 PPB	229.4
23	O-XYLENE	83.58 PPB	268.8

NOTES

JOE BYRD, JR.
 DULUTH ANGB
 025-003BH

15-17 10g }
 20 µl injection } J3



TIME PRINTED: MAY 15,95 13:13

SAMPLE TIME: MAY 15,95 13:06

METHOD

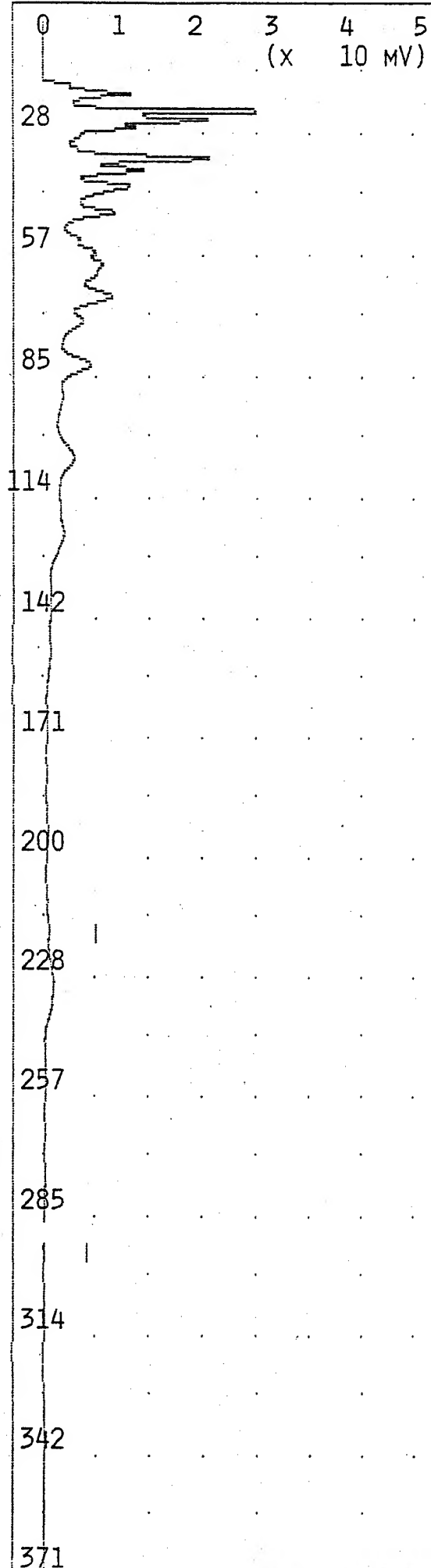
SLOPE UP 0.500 MV/SEC
 SLOPE DOWN 1.500 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 14 ML/MIN
 B/F FLOW 14 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 30 C
 MAX GAIN 1000
 ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.842 MVS	13.8
2	UNKNOWN	6.142 MVS	14.8
3	UNKNOWN	238.5 MVS	17.6
4	UNKNOWN	510.2 MVS	21.5
5	UNKNOWN	622.9 MVS	24.0
6	UNKNOWN	492.6 MVS	25.4
7	UNKNOWN	85.06 MVS	30.2
8	UNKNOWN	376.1 MVS	32.6
9	UNKNOWN	254.6 MVS	35.6
10	UNKNOWN	402.8 MVS	39.6
11	UNKNOWN	296.3 MVS	45.4
12	BENZENE	137.7 PPB	51.6
13	UNKNOWN	388.1 MVS	54.2
14	UNKNOWN	197.7 MVS	64.9
15	UNKNOWN	144.0 MVS	70.8
16	UNKNOWN	155.2 MVS	80.9
17	UNKNOWN	55.99 MVS	88.4
18	TOLUENE	156.7 PPB	102.8
19	UNKNOWN	4.711 MVS	120.5
20	UNKNOWN	3.300 MVS	148.6
21	ETHYLBENZENE	122.6 PPB	213.2
22	M,P-XYLENE	916.4 PPB	228.2
23	UNKNOWN	444.7 MVS	232.8
24	O-XYLENE	553.4 PPB	268.5

NOTES

JOE BYRD, JR.
 DULUTH ANGB
 025-003BH
 20.0-22.0 10G
 50 MICROLITER INJECTOR



TIME PRINTED: MAY 15,95 13:45

SAMPLE TIME: MAY 15,95 13:39

METHOD

SLOPE UP 0.500 MV/SEC

SLOPE DOWN 1.500 MV/SEC

MIN AREA 0.000 MVSEC

MIN HEIGHT 0.000 MV

ANALYSIS DELAY 0.0 SEC

WINDOW PERCENT 10.0 %

DET FLOW 14 ML/MIN

B/F FLOW 14 ML/MIN

AUX FLOW 0 ML/MIN

OVEN TEMP 40 C

AMB TEMP 30 C

MAX GAIN 1000

ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
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NOTES

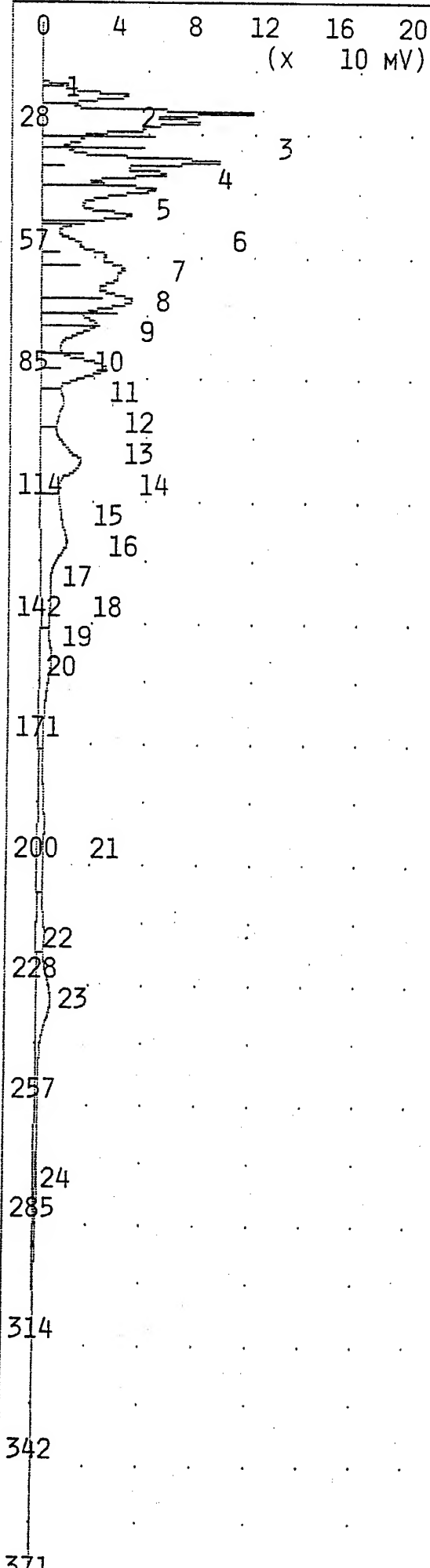
JOE BYRD, JR.

DULUTH ANGB

025-003BH

25.0' 10G

20 MICROLITER INJECTON



TIME PRINTED: MAY 15,95 13:57

SAMPLE TIME: MAY 15,95 13:51

METHOD

SLOPE UP 0.500 MV/SEC
 SLOPE DOWN 1.500 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 14 ML/MIN
 B/F FLOW 14 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 30 C
 MAX GAIN 1000
 ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	16.03 MVS	15.1
2	UNKNOWN	122.2 MVS	17.7
3	UNKNOWN	195.3 MVS	21.6
4	UNKNOWN	160.9 MVS	23.9
5	UNKNOWN	126.8 MVS	25.4
6	UNKNOWN	244.5 MVS	32.9
7	UNKNOWN	164.4 MVS	35.8
8	UNKNOWN	217.5 MVS	39.6
9	UNKNOWN	172.4 MVS	45.6
10	BENZENE	20.46 PPB	51.6
11	UNKNOWN	96.80 MVS	54.7
12	UNKNOWN	143.5 MVS	57.8
13	UNKNOWN	115.1 MVS	59.9
14	UNKNOWN	242.2 MVS	65.3
15	UNKNOWN	161.4 MVS	71.0
16	UNKNOWN	206.2 MVS	81.3
17	UNKNOWN	96.68 MVS	89.2
18	TOLUENE	118.3 PPB	102.9
19	UNKNOWN	275.6 MVS	121.6
20	UNKNOWN	118.0 MVS	149.4
21	UNKNOWN	92.00 MVS	190.0
22	ETHYLBENZENE	42.25 PPB	214.4
23	M,P-XYLENE	363.7 PPB	230.0
24	O-XYLENE	46.73 PPB	266.6

NOTES

JOE BYRD, JR.
 DULUTH ANGB
 025-003BH RESHOT
 25.0' 10G
 100 MICROLITER INJECTION

0 2 4 6 8 10
(X 10 MV)

TIME PRINTED: MAY 15,95 14:08

SAMPLE TIME: MAY 15,95 14:02

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 30 C
MAX GAIN 1000
ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.077 MVS	13.8
2	UNKNOWN	9.573 MVS	15.1
3	UNKNOWN	49.16 MVS	17.6
4	UNKNOWN	61.85 MVS	21.7
5	UNKNOWN	33.52 MVS	23.8
6	UNKNOWN	17.83 MVS	25.5
7	UNKNOWN	18.59 MVS	27.6
8	UNKNOWN	63.77 MVS	32.7
9	UNKNOWN	52.54 MVS	35.7
10	UNKNOWN	39.50 MVS	39.5
11	UNKNOWN	58.61 MVS	46.0
12	BENZENE	12.64 PPB	54.6
13	UNKNOWN	78.24 MVS	58.0
14	UNKNOWN	337.6 MVS	66.0
15	UNKNOWN	51.08 MVS	81.3
16	UNKNOWN	65.62 MVS	89.4
17	TOLUENE	152.1 PPB	101.8
18	UNKNOWN	63.00 MVS	120.9
19	UNKNOWN	42.42 MVS	131.2
20	UNKNOWN	48.59 MVS	147.8
21	UNKNOWN	41.26 MVS	191.8
22	ETHYLBENZENE	12.14 PPB	214.8
23	M,P-XYLENE	30.80 PPB	229.8

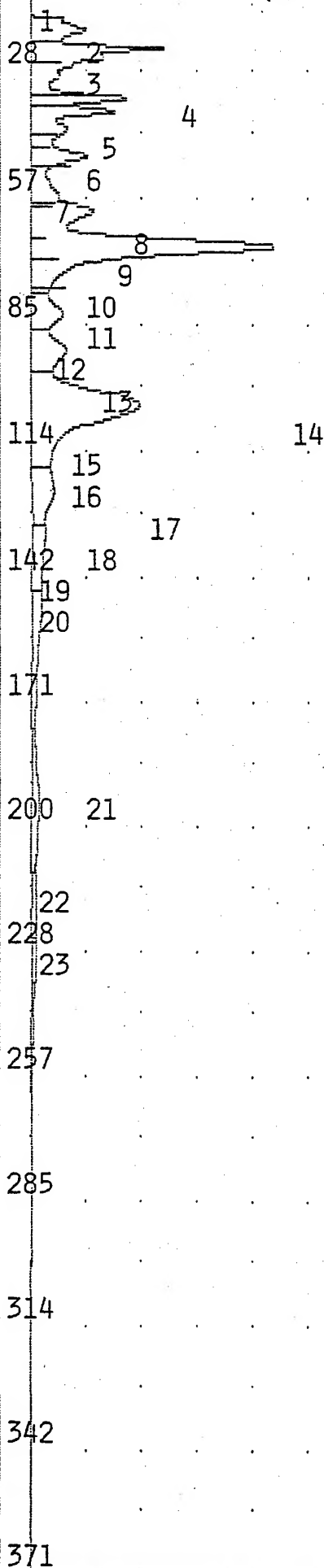
NOTES

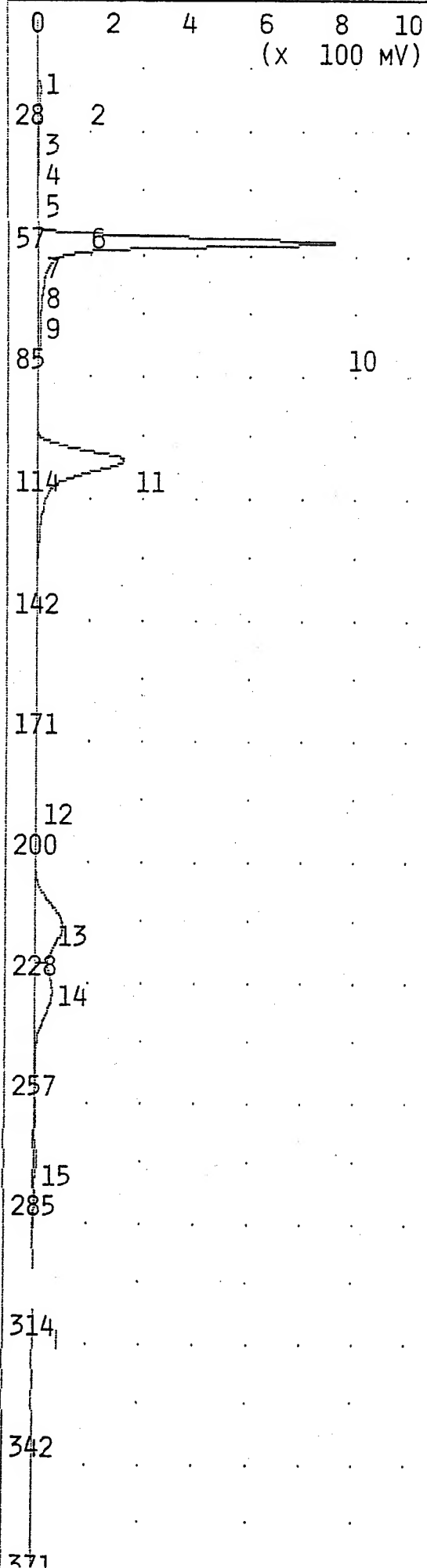
JOE BYRD, JR.

DULUTH ANGB

025-002BH

0.5- 2.5 10G





TIME PRINTED: MAY 15,95 14:24

SAMPLE TIME: MAY 15,95 14:18

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000
ANALYSIS TIME 400.0 SEC

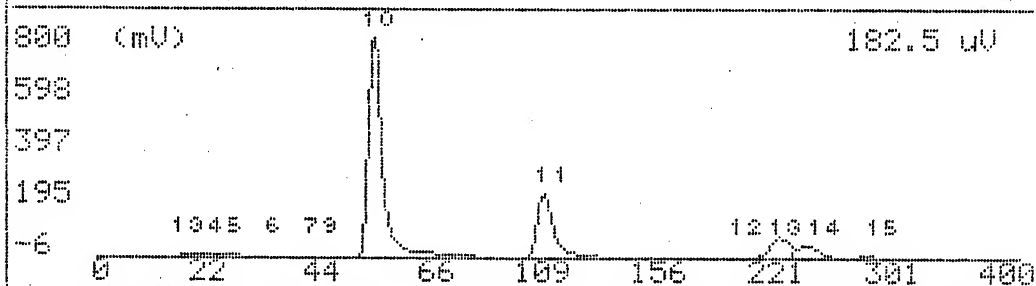
PEAK REPORT

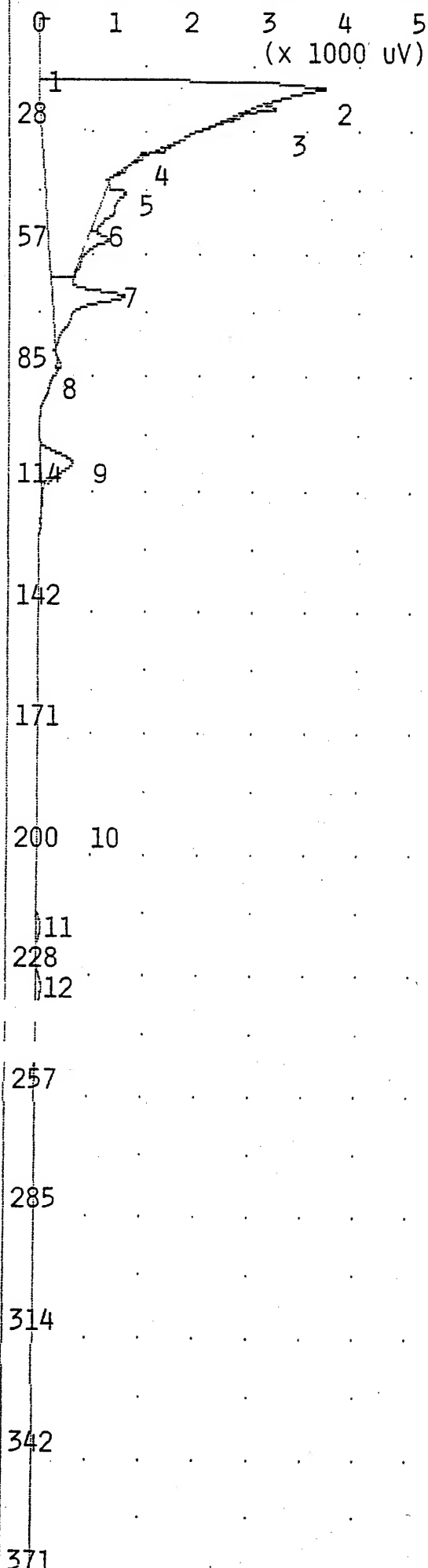
PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.042 MVS	13.3
2	UNKNOWN	10.22 MVS	15.2
3	UNKNOWN	47.62 MVS	16.6
4	UNKNOWN	113.9 MVS	21.7
5	UNKNOWN	0.348 MVS	25.4
6	UNKNOWN	1.325 MVS	32.4
7	UNKNOWN	0.311 MVS	38.9
8	UNKNOWN	0.614 MVS	40.8
9	UNKNOWN	0.499 MVS	44.9
10	BENZENE	899.5 PPB	52.0
11	TOLUENE	828.1 PPB	103.3
12	UNKNOWN	11.85 MVS	186.6
13	ETHYLBENZENE	717.6 PPB	213.2
14	M,P-XYLENE	1.437 PPM	228.6
15	O-XYLENE	823.8 PPB	268.2

NOTES

JOE BYRD, JR.
DULUTH ANGB
1 PPM BTEX

G.C. Ready		108+ GC Function	May 15, 95	14:30
-- Analysis No 19		-- Run at --	May 15, 95	14:18
Pk No	Name	Conc/Area	Alarm	Ret. Time
7	Unknown	0.311 mUS	-No-	38.9 sec
8	Unknown	0.614 mUS	-No-	40.8 sec
9	Unknown	0.499 mUS	-No-	44.9 sec
10	benzene	1.000 ppm	-No-	52.8 sec
11	toluene	1.000 ppm	-No-	103.3 sec
12	Unknown	11.85 mUS	-No-	186.6 sec
13	ethylbenzene	1.000 ppm	-No-	213.2 sec
14	m,p-xylene	2.000 ppm	-No-	228.6 sec
15	o-xylene	1.001 ppm	-No-	268.2 sec
- Detected 15 peaks. Use + - to scroll [405 sec]				





TIME PRINTED: MAY 15,95 14:39

SAMPLE TIME: MAY 15,95 14:32

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000
ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.042 MVS	13.7
2	UNKNOWN	67.73 MVS	16.7
3	UNKNOWN	0.590 MVS	21.5
4	UNKNOWN	0.214 MVS	32.7
5	UNKNOWN	1.780 MVS	40.8
6	BENZENE	0.374 PPB	51.8
7	UNKNOWN	5.497 MVS	65.0
8	UNKNOWN	0.105 MVS	81.0
9	TOLUENE	1.837 PPB	103.8
10	UNKNOWN	1.726 MVS	195.0
11	ETHYLBENZENE	2.816 PPB	215.0
12	M,P-XYLENE	5.882 PPB	229.0

NOTES

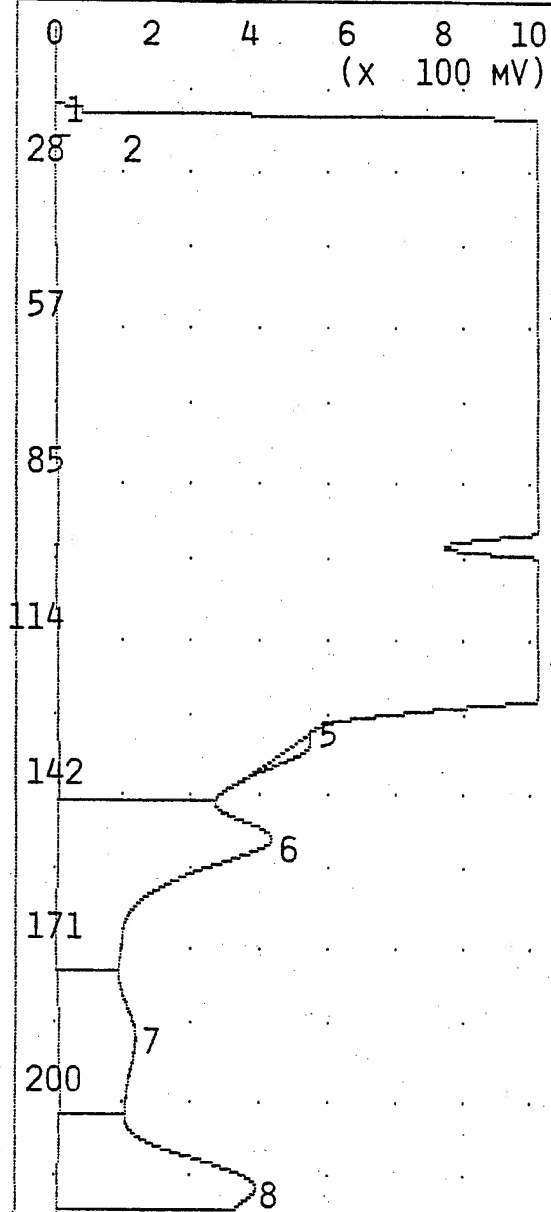
JOE BYRD, JR.

DULUTH ANGB

~~1 PPM BTEX~~

AIR BLANK 55

ANALYSIS #22 10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 15,95 15:00

SAMPLE TIME: MAY 15,95 14:54

METHOD

SLOPE UP 0.500 MV/SEC

SLOPE DOWN 1.500 MV/SEC

MIN AREA 0.000 MVSEC

MIN HEIGHT 0.000 MV

ANALYSIS DELAY 0.0 SEC

WINDOW PERCENT 10.0 %

DET FLOW 14 ML/MIN

B/F FLOW 14 ML/MIN

AUX FLOW 0 ML/MIN

OVEN TEMP 40 C

AMB TEMP 31 C

MAX GAIN 1000

ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.373 MVS	13.8
2	UNKNOWN	55.12 MVS	14.8
3	BENZENE	1160. PPM2	47.6
4	TOLUENE	52.51 PPM2	110.4
5	UNKNOWN	177.7 MVS	130.8
6	UNKNOWN	7.988 VSEC	149.2
7	UNKNOWN	3.961 VSEC	186.4
8	ETHYLBENZENE	5.104 PPM	214.0
9	M,P-XYLENE	41.04 PPM	229.6
10	O-XYLENE	22.70 PPM	268.0

PPM1 = ALARM 1 PPM2 = ALARM2

NOTES

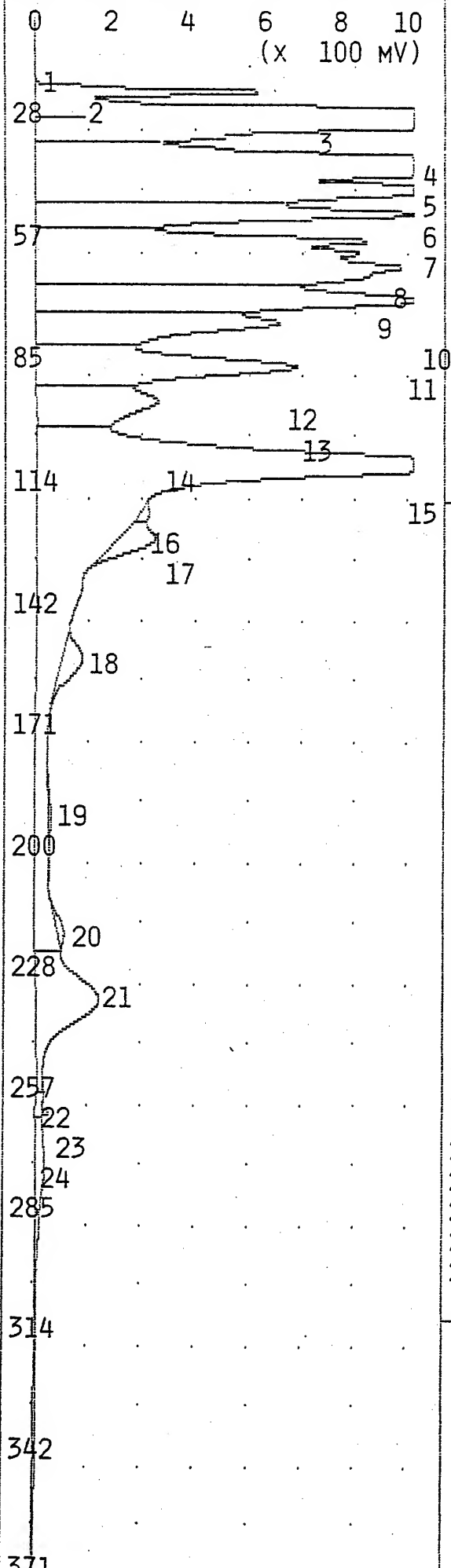
JOE BYRD, JR.

DULUTH ANGB

025-002BH RESHOT

5.0- 7.0 10G

20 MICROLITER INJECTION



TIME PRINTED: MAY 15, 95 15:47

SAMPLE TIME: MAY 15, 95 15:41

METHOD

SLOPE UP 0.500 MV/SEC
 SLOPE DOWN 1.500 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 14 ML/MIN
 B/F FLOW 14 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 31 C
 MAX GAIN 1000
 ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.119 MVS	13.8
2	UNKNOWN	4.945 MVS	14.8
3	UNKNOWN	1.234 VSEC	17.7
4	UNKNOWN	19.65 VSEC	23.9
5	UNKNOWN	12.70 VSEC	34.8
6	UNKNOWN	6.993 VSEC	40.4
7	UNKNOWN	4.180 VSEC	46.0
8	BENZENE	1.011 PPM	52.2
9	UNKNOWN	2.146 VSEC	55.1
10	UNKNOWN	5.807 VSEC	58.2
11	UNKNOWN	5.636 VSEC	66.0
12	UNKNOWN	3.708 VSEC	71.4
13	UNKNOWN	4.322 VSEC	81.8
14	UNKNOWN	2.574 VSEC	89.8
15	TOLUENE	10.71 PPM	104.2
16	UNKNOWN	85.76 MVS	115.3
17	UNKNOWN	594.7 MVS	121.4
18	UNKNOWN	465.4 MVS	149.6
19	UNKNOWN	97.55 MVS	186.6
20	ETHYLBENZENE	135.1 PPB	214.8
21	M,P-XYLENE	7.808 PPM	230.2
22	UNKNOWN	0.019 MVS	252.8
23	UNKNOWN	134.7 MVS	257.0
24	O-XYLENE	5.188 PPM	269.6

NOTES

JOE BYRD, JR.
 DULUTH ANGB
 025-002BH
 10.0-12.0 10G
 5 MICROLITER INJECTION

0 2 4 6 8 10
(x 100 MV)

TIME PRINTED: MAY 15,95 16:03

SAMPLE TIME: MAY 15,95 15:57

METHOD

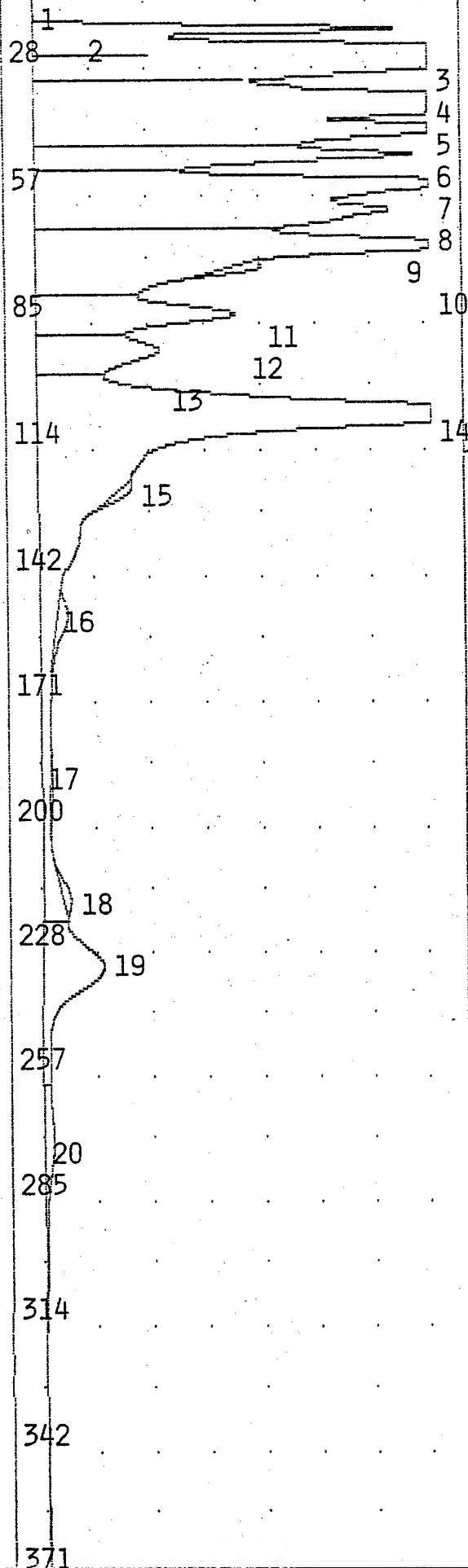
SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 14 ML/MIN
B/F FLOW 14 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000
ANALYSIS TIME 400.0 SEC

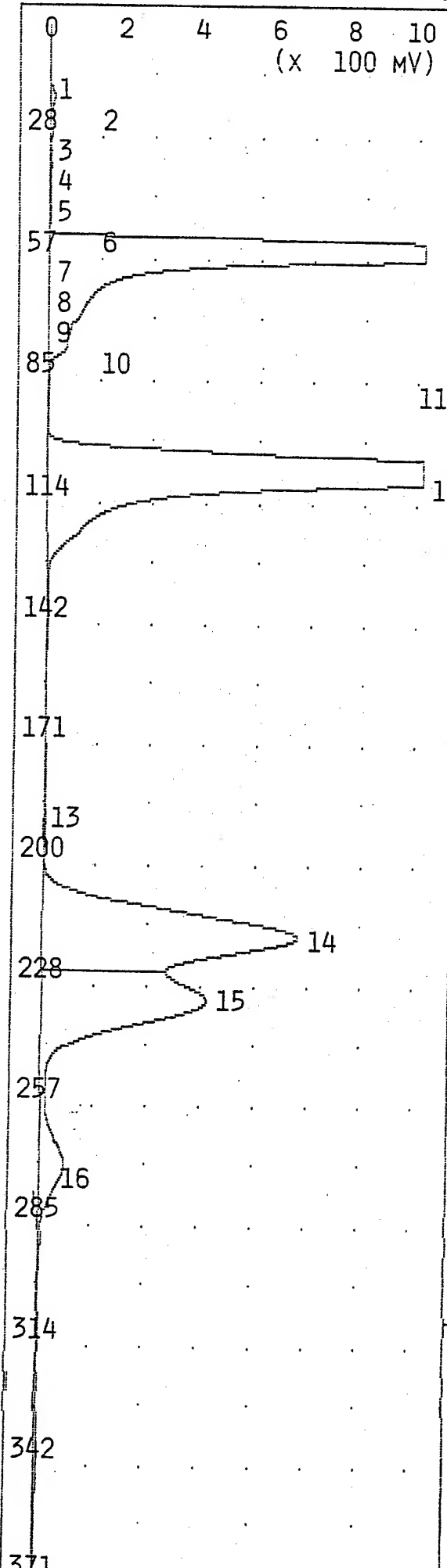
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.062 MVS	13.8
2	UNKNOWN	5.352 MVS	14.8
3	UNKNOWN	2.011 VSEC	17.8
4	UNKNOWN	22.01 VSEC	24.2
5	UNKNOWN	11.79 VSEC	34.7
6	UNKNOWN	6.533 VSEC	40.4
7	UNKNOWN	3.705 VSEC	46.1
8	BENZENE	3.685 PPM	52.5
9	UNKNOWN	5.181 VSEC	58.2
10	UNKNOWN	9.488 VSEC	66.2
11	UNKNOWN	181.3 MVS	71.2
12	UNKNOWN	3.222 VSEC	81.7
13	UNKNOWN	2.352 VSEC	89.8
14	TOLUENE	10.45 PPM	104.2
15	UNKNOWN	143.5 MVS	120.4
16	UNKNOWN	215.5 MVS	149.6
17	UNKNOWN	42.78 MVS	186.8
18	ETHYLBENZENE	167.7 PPB	214.8
19	M,P-XYLENE	7.234 PPM	230.0
20	O-XYLENE	4.654 PPM	269.3

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-002BH RE-RESHOT
5.0- 7.0 10G
5 MICROLITER INJECTION





TIME PRINTED: MAY 15, 95 16:44

SAMPLE TIME: MAY 15, 95 16:38

METHOD

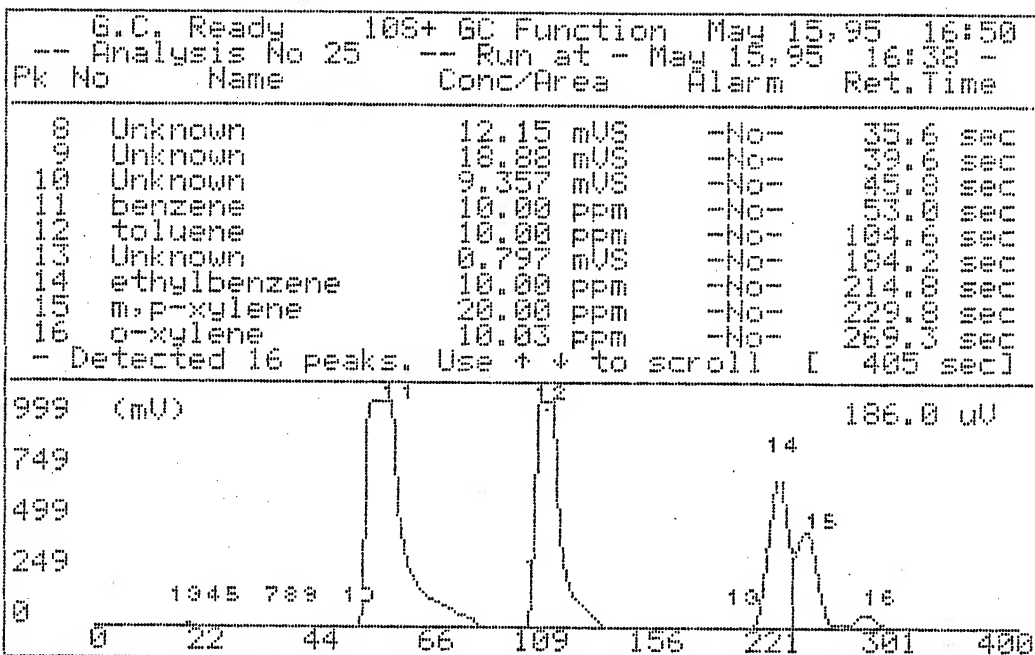
SLOPE UP 0.500 MV/SEC
 SLOPE DOWN 1.500 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 14 ML/MIN
 B/F FLOW 14 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 31 C
 MAX GAIN 1000
 ANALYSIS TIME 400.0 SEC

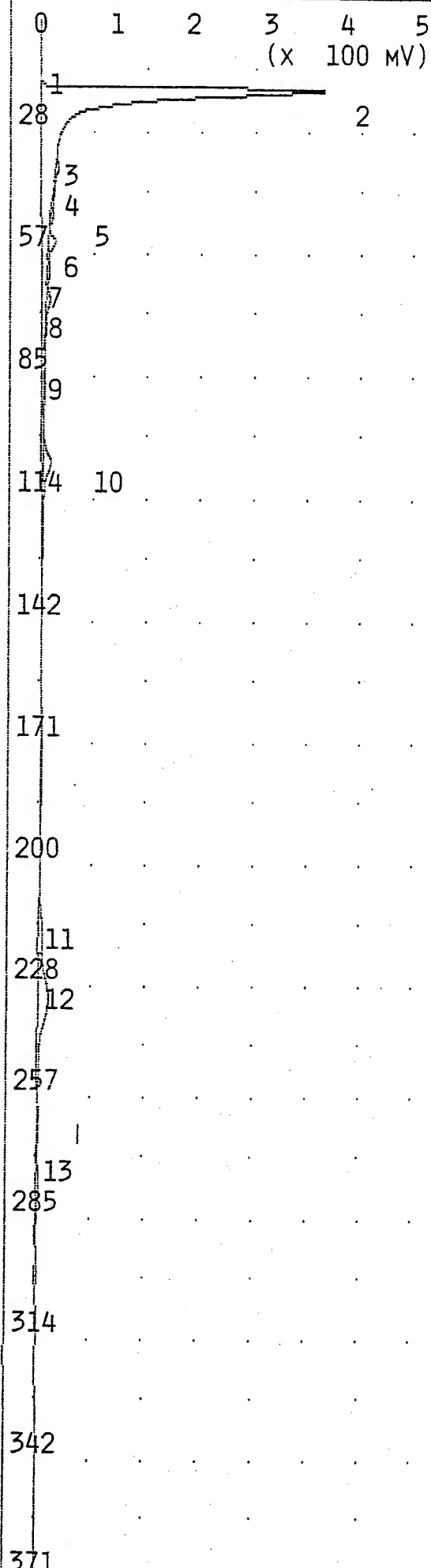
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.030 MVS	13.7
2	UNKNOWN	10.39 MVS	15.3
3	UNKNOWN	55.41 MVS	16.7
4	UNKNOWN	43.66 MVS	21.8
5	UNKNOWN	0.439 MVS	23.7
6	UNKNOWN	35.54 MVS	25.6
7	UNKNOWN	18.13 MVS	33.0
8	UNKNOWN	12.13 MVS	35.6
9	UNKNOWN	18.84 MVS	39.6
10	UNKNOWN	9.326 MVS	45.8
11	BENZENE	9.052 PPM	53.0
12	TOLUENE	8.789 PPM	104.6
13	UNKNOWN	0.797 MVS	184.2
14	ETHYLBENZENE	8.293 PPM	214.8
15	M,P-XYLENE	16.84 PPM	229.8
16	O-XYLENE	8.391 PPM	269.3

NOTES

JOE BYRD, JR.
 DULUTH ANGB
 10 PPM BTEX





TIME PRINTED: MAY 15,95 16:58

SAMPLE TIME: MAY 15,95 16:52

METHOD

SLOPE UP	0.500	MV/SEC
SLOPE DOWN	1.500	MV/SEC
MIN AREA	0.000	MVSEC
MIN HEIGHT	0.000	MV
ANALYSIS DELAY	0.0	SEC
WINDOW PERCENT	10.0	%
DET FLOW	14	ML/MIN
B/F FLOW	14	ML/MIN
AUX FLOW	0	ML/MIN
OVEN TEMP	40	C
AMB TEMP	31	C
MAX GAIN	1000	
ANALYSIS TIME	400.0	SEC

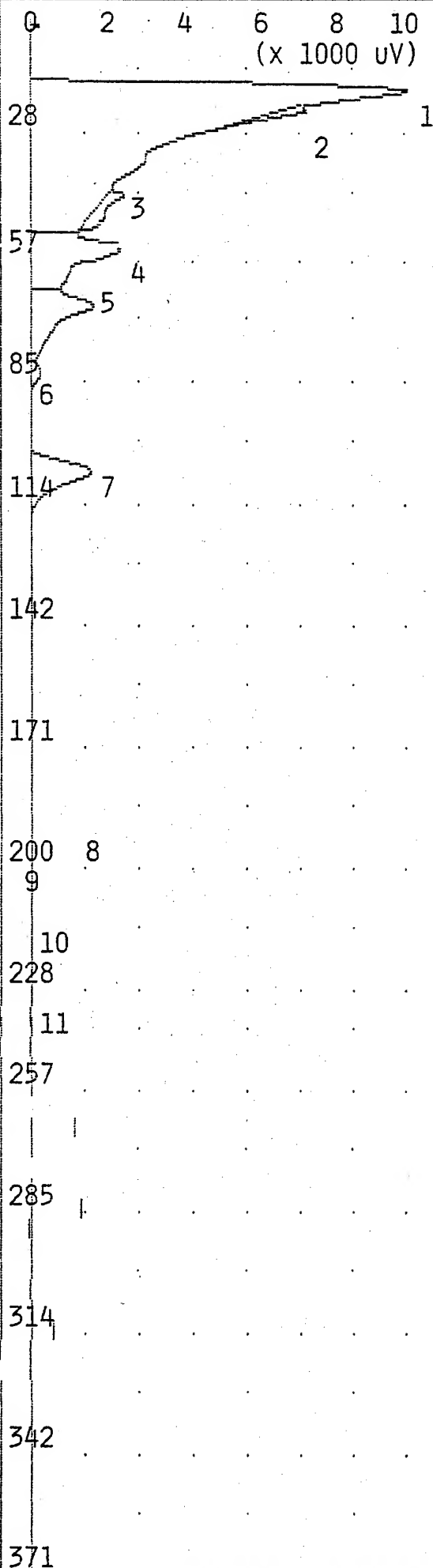
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.046 MVS	13.5
2	UNKNOWN	2.393 VSEC	16.6
3	UNKNOWN	11.94 MVS	34.8
4	UNKNOWN	1.233 MVS	39.5
5	UNKNOWN	6.099 MVS	45.6
6	BENZENE	11.05 PPB	52.0
7	UNKNOWN	8.683 MVS	58.0
8	UNKNOWN	21.30 MVS	65.8
9	UNKNOWN	2.818 MVS	81.6
10	TOLUENE	37.93 PPB	103.7
11	ETHYLBENZENE	40.74 PPB	214.4
12	M,P-XYLENE	521.2 PPB	229.6
13	O-XYLENE	103.4 PPB	269.3

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK

ANALYTIC #27 10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 15,95 17:09

SAMPLE TIME: MAY 15,95 17:02

METHOD

SLOPE UP 0.500 MV/SEC
 SLOPE DOWN 1.500 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 14 ML/MIN
 B/F FLOW 14 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 31 C
 MAX GAIN 1000
 ANALYSIS TIME 400.0 SEC

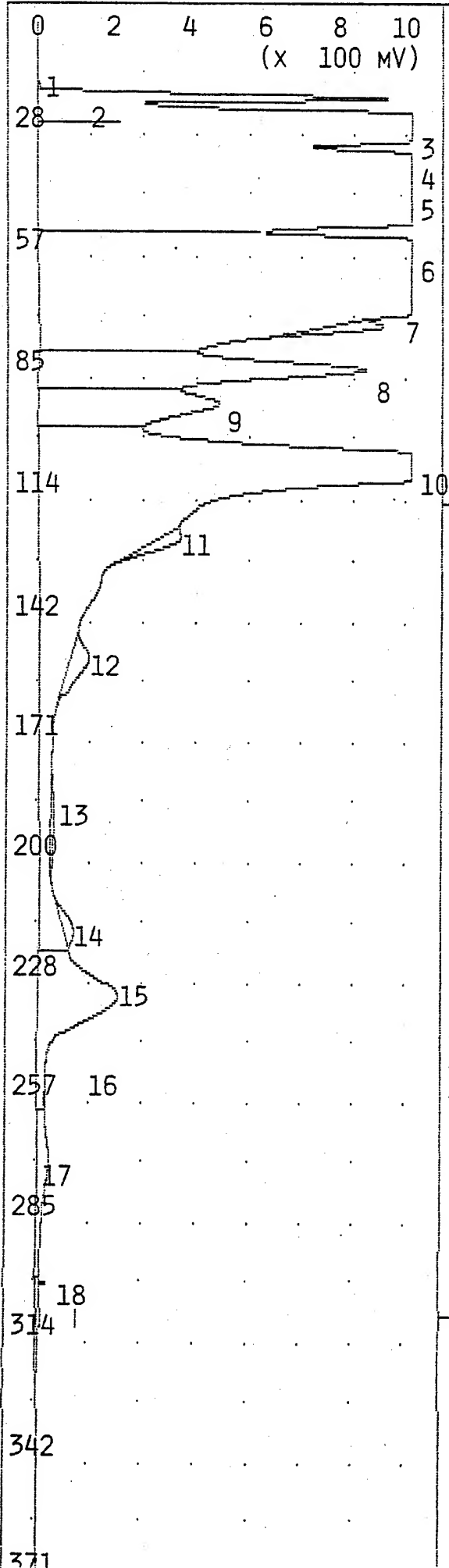
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	153.8 MVS	17.0
2	UNKNOWN	1.587 MVS	21.6
3	UNKNOWN	3.106 MVS	41.1
4	BENZENE	10.19 PPB	52.6
5	UNKNOWN	20.02 MVS	66.4
6	UNKNOWN	7.491 MVS	81.2
7	TOLUENE	13.63 PPB	104.9
8	UNKNOWN	0.142 MVS	190.4
9	UNKNOWN	0.037 MVS	193.4
10	ETHYLBENZENE	3.794 PPB	216.0
11	M,P-XYLENE	12.62 PPB	231.2

NOTES

JOE BYRD, JR.
 DULUTH ANGB
 AIR BLANK
 400 MICROLITER INJECTON

ANALYSIS #29 10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 15, 95 17:30
 SAMPLE TIME: MAY 15, 95 17:23

METHOD

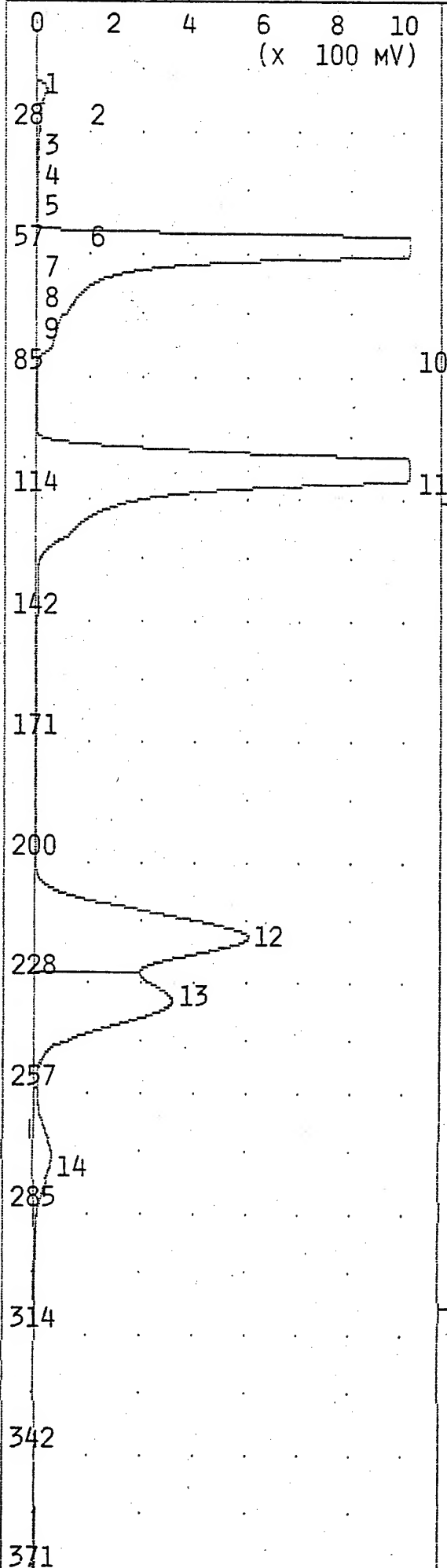
SLOPE UP 0.500 MV/SEC
 SLOPE DOWN 1.500 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 14 ML/MIN
 B/F FLOW 14 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 31 C
 MAX GAIN 1000
 ANALYSIS TIME 400.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.057 MVS	13.8
2	UNKNOWN	6.434 MVS	14.8
3	UNKNOWN	1.929 VSEC	17.8
4	UNKNOWN	26.95 VSEC	21.4
5	UNKNOWN	48.52 VSEC	39.3
6	UNKNOWN	116.5 VSEC	58.4
7	UNKNOWN	443.8 MVS	71.3
8	UNKNOWN	5.656 VSEC	81.6
9	UNKNOWN	3.681 VSEC	89.6
10	TOLUENE	18.38 PPM	104.4
11	UNKNOWN	305.1 MVS	120.5
12	UNKNOWN	459.0 MVS	149.4
13	UNKNOWN	110.6 MVS	186.2
14	ETHYLBENZENE	198.0 PPB	214.4
15	M,P-XYLENE	11.62 PPM	229.4
16	UNKNOWN	1.110 MVS	251.2
17	O-XYLENE	5.414 PPM	268.8
18	UNKNOWN	306.8 MVS	298.4

NOTES

JOE BYRD, JR.
 DULUTH ANGB
 025-001BH
 5.0- 7.0 3G
 10 MICROLITER INJECTION



TIME PRINTED: MAY 15,95 17:43

SAMPLE TIME: MAY 15,95 17:36

METHOD

SLOPE UP 0.500 MV/SEC
 SLOPE DOWN 1.500 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 14 ML/MIN
 B/F FLOW 14 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 31 C
 MAX GAIN 1000
 ANALYSIS TIME 400.0 SEC

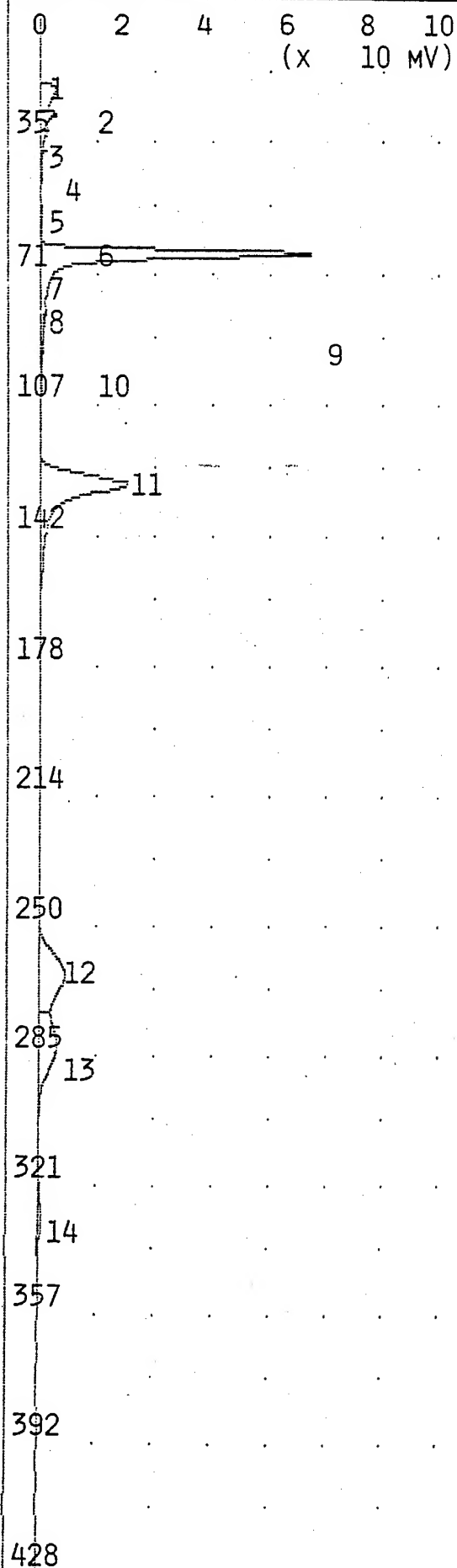
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.037 MVS	13.5
2	UNKNOWN	26.19 MVS	15.4
3	UNKNOWN	266.1 MVS	16.8
4	UNKNOWN	5.603 MVS	21.8
5	UNKNOWN	0.872 MVS	25.7
6	UNKNOWN	3.337 MVS	33.1
7	UNKNOWN	1.531 MVS	35.8
8	UNKNOWN	2.619 MVS	40.5
9	UNKNOWN	1.366 MVS	45.8
10	BENZENE	10.94 PPM	53.4
11	TOLUENE	9.802 PPM	105.3
12	ETHYLBENZENE	8.544 PPM	215.8
13	M,P-XYLENE	16.56 PPM	230.8
14	O-XYLENE	7.747 PPM	270.4

NOTES

JOE BYRD, JR.
 DULUTH ANGB
 10 PPM BTEX

* ANALYSIS #1 10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 16,95 08:11
SAMPLE TIME: MAY 16,95 08:03

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 11 ML/MIN
B/F FLOW 11 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 28 C
MAX GAIN 1000
ANALYSIS TIME 500.0 SEC

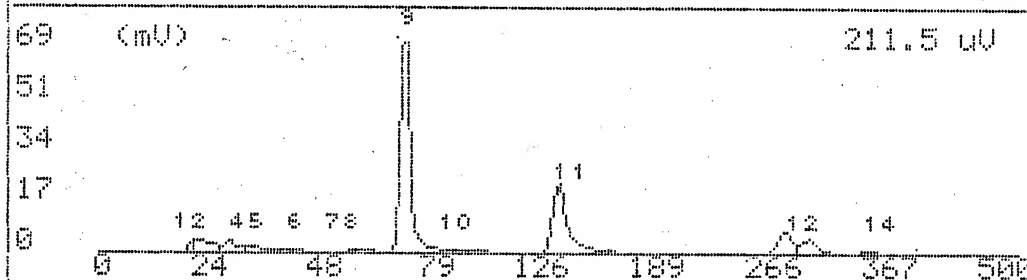
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.081 MVS	16.3
2	UNKNOWN	5.752 MVS	18.5
3	UNKNOWN	18.19 MVS	20.0
4	UNKNOWN	14.28 MVS	26.2
5	UNKNOWN	10.32 MVS	31.0
6	UNKNOWN	4.422 MVS	39.4
7	UNKNOWN	1.263 MVS	47.4
8	UNKNOWN	4.876 MVS	51.4
9	UNKNOWN	243.3 MVS	63.3
10	UNKNOWN	0.726 MVS	79.6
11	UNKNOWN	167.5 MVS	126.2
12	UNKNOWN	98.87 MVS	260.8
13	UNKNOWN	76.18 MVS	280.2
14	UNKNOWN	16.68 MVS	329.3

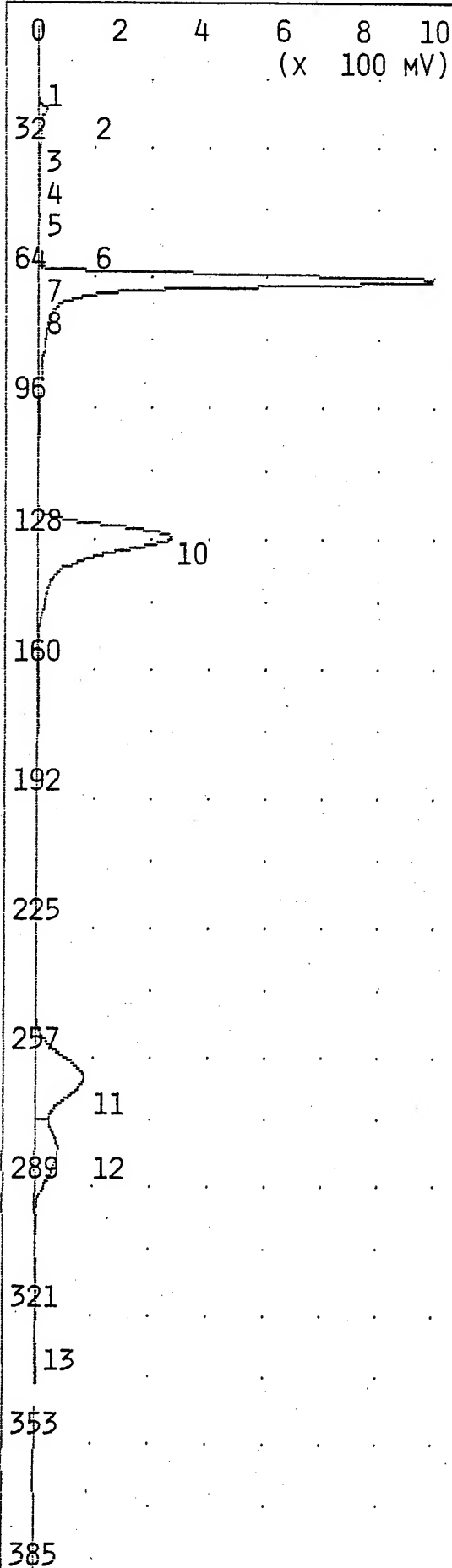
NOTES

JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX

G.C. Ready		10S+ GC Function			May 16, 95 08:18
-- Analysis No 1		-- Run at - May 16, 95 08:03 -			
Pk No	Name	Conc/Area	Alarm	Ret. Time	
6	Unknown	4.422 mUS	-No-	39.4 sec	
7	Unknown	1.263 mUS	-No-	47.4 sec	
8	Unknown	4.876 mUS	-No-	51.4 sec	
9	benzene	100.0 ppb	-No-	63.3 sec	
10	Unknown	0.726 mUS	-No-	79.6 sec	
11	toluene	100.0 ppb	-No-	126.2 sec	
12	ethylbenzene	100.0 ppb	-No-	260.8 sec	
13	m,p-xylene	200.0 ppb	-No-	280.2 sec	
14	o-xylene	100.0 ppb	-No-	329.3 sec	
- Detected 14 peaks. Use + + to scroll					[505 sec]



ANALYSIS #2 10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 16,95 08:28
SAMPLE TIME: MAY 16,95 08:20

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 11 ML/MIN
B/F FLOW 11 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 29 C
MAX GAIN 1000
ANALYSIS TIME 450.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.046 MVS	16.4
2	UNKNOWN	7.395 MVS	18.4
3	UNKNOWN	83.33 MVS	20.3
4	UNKNOWN	64.17 MVS	26.4
5	UNKNOWN	0.337 MVS	30.9
6	UNKNOWN	42.69 MVS	35.6
7	UNKNOWN	0.630 MVS	39.6
8	UNKNOWN	36.11 MVS	47.5
9	BENZENE	1.763 PPM	62.9
10	TOLUENE	1.857 PPM	126.0
11	ETHYLBENZENE	1.583 PPM	260.0
12	M,P-XYLENE	2.249 PPM	278.9
13	O-XYLENE	814.9 PPB	325.0

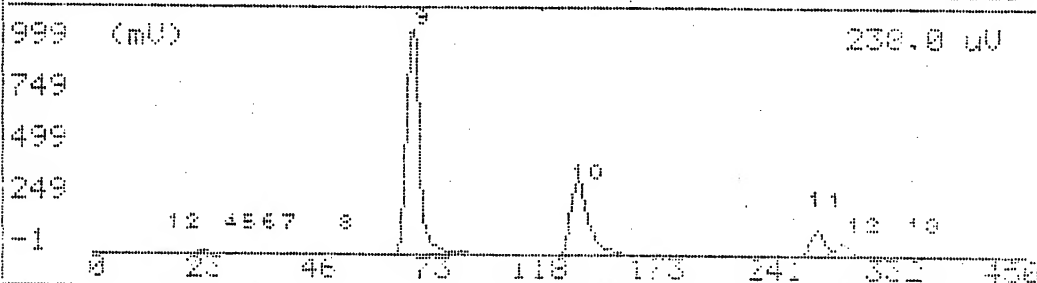
NOTES

JOE BYRD, JR.
DULUTH ANGB
1 PPM BTEX

G.C. Ready 100+ GC Function May 16, 95 08:33
 -- Analysis No 1 -- Run at -- May 11, 95 08:20 --
 Pk No Name Conc Area Alarm Ret. Time

5	Unknown	0.337	mV	-No-	36.0	sec
6	Unknown	42.72	mV	-No-	36.0	sec
7	Unknown	0.530	mV	-No-	36.0	sec
8	Unknown	36.16	mV	-No-	47.0	sec
10	benzene	1.000	ppm	-No-	60.0	sec
11	toluene	1.000	ppm	-No-	60.0	sec
11	ethylbenzene	1.000	ppm	-No-	60.0	sec
12	m,p-xylene	2.001	ppm	-No-	60.0	sec
13	o-xylene	1.012	ppm	-No-	60.0	sec

- Detected 13 peaks. Use * + to scroll [45.0 sec]



ANALYSIS #3

10S+ GC FUNCTION ANALYSIS REPORT

0 2 4 6 8 10
(x 100 MV)

TIME PRINTED: MAY 16,95 08:42

SAMPLE TIME: MAY 16,95 08:34

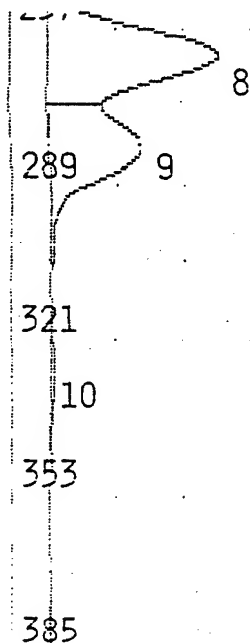
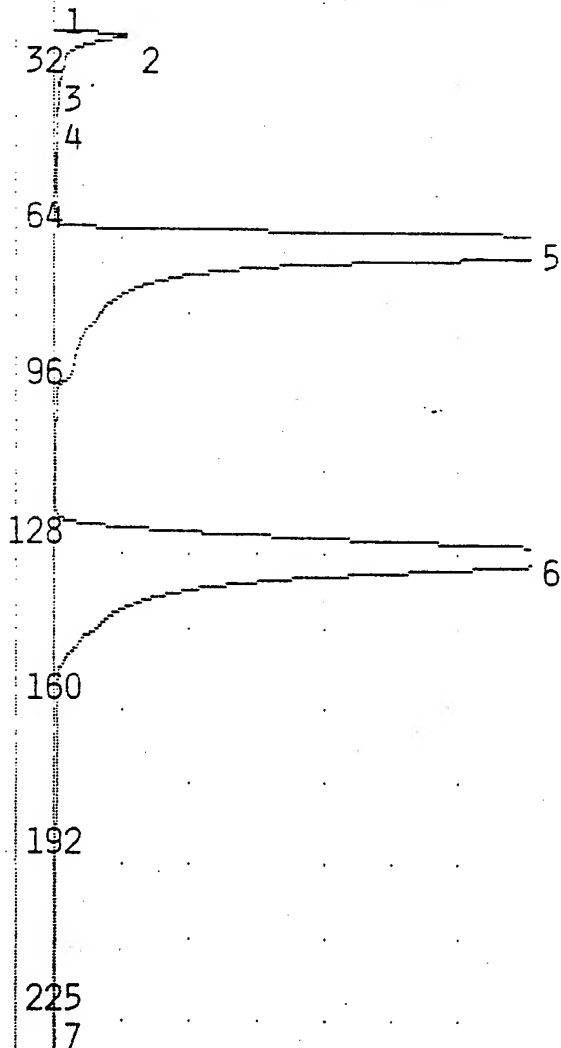
METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 11 ML/MIN
B/F FLOW 11 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 30 C
MAX GAIN 1000

ANALYSIS TIME 450.0 SEC

PEAK REPORT

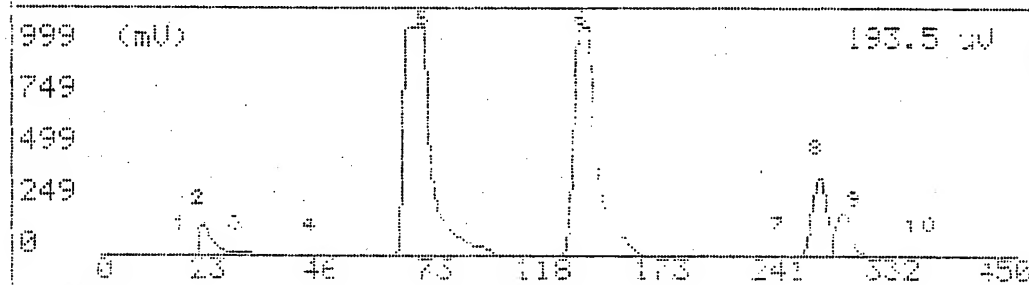
PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.033 MVS	16.2
2	UNKNOWN	773.4 MVS	20.1
3	UNKNOWN	2.087 MVS	26.0
4	UNKNOWN	3.702 MVS	42.2
5	BENZENE	3.714 PPM	63.1
6	TOLUENE	4.081 PPM	126.9
7	UNKNOWN	2.221 MVS	224.0
8	ETHYLBENZENE	3.060 PPM	261.0
9	M,P-XYLENE	6.604 PPM	279.4
10	O-XYLENE	2.210 PPM	326.4



NOTES

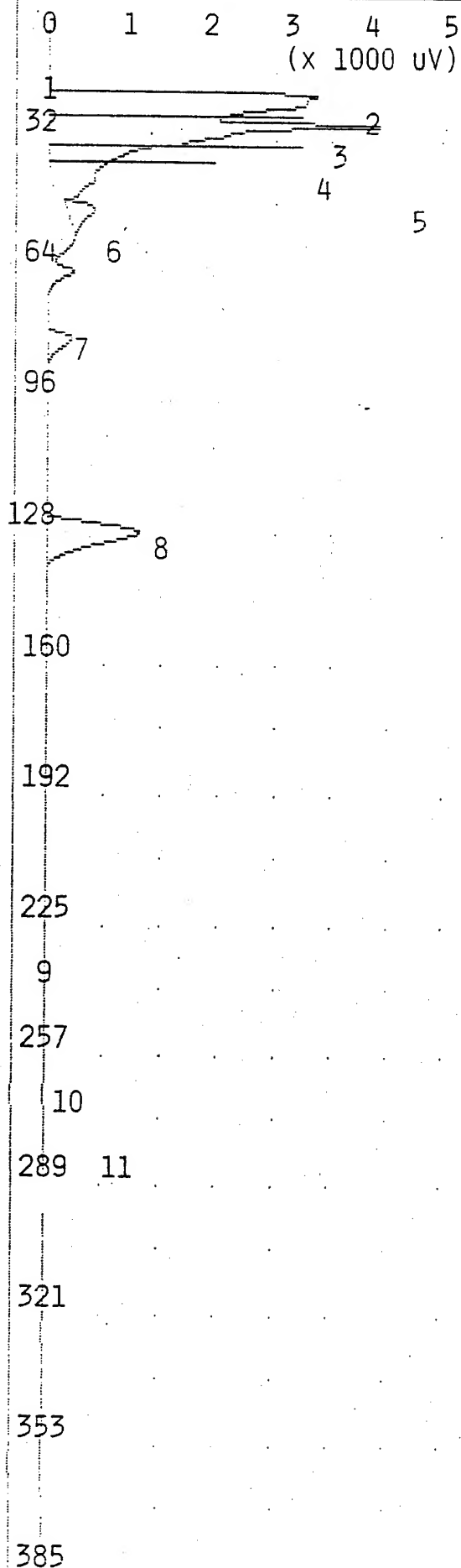
JOE BYRD, JR.
DULUTH ANGB
10 PPM BTEX

G.C. Ready		100+ GC Function		Ma. 16	17	10.148
-- Analysis No. 1		-- Run at --		May 10.95	361	1.1
Pk No	Name	Conc/Area	Alarm	Set	Time	
2	Unknown	773.6	muS	-No-	23.4	990
3	Unknown	2.087	muS	-No-	26.6	990
4	Unknown	3.702	muS	-No-	40.1	990
5	benzene	10.00	ppm	-No-	66.4	990
6	toluene	10.00	ppm	-No-	66.6	990
7	Unknown	2.221	muS	-No-	74.4	990
8	ethylbenzene	10.00	ppm	-No-	74.6	990
9	m,p-xylene	29.01	ppm	-No-	79.0	990
10	o-xylene	10.00	ppm	-No-	86.4	990
- Detected 10 peaks. Use + + to scroll					1	485 sec



ANALYSIS #4

10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 16,95 08:58

SAMPLE TIME: MAY 16,95 08:50

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 11 ML/MIN
B/F FLOW 11 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000

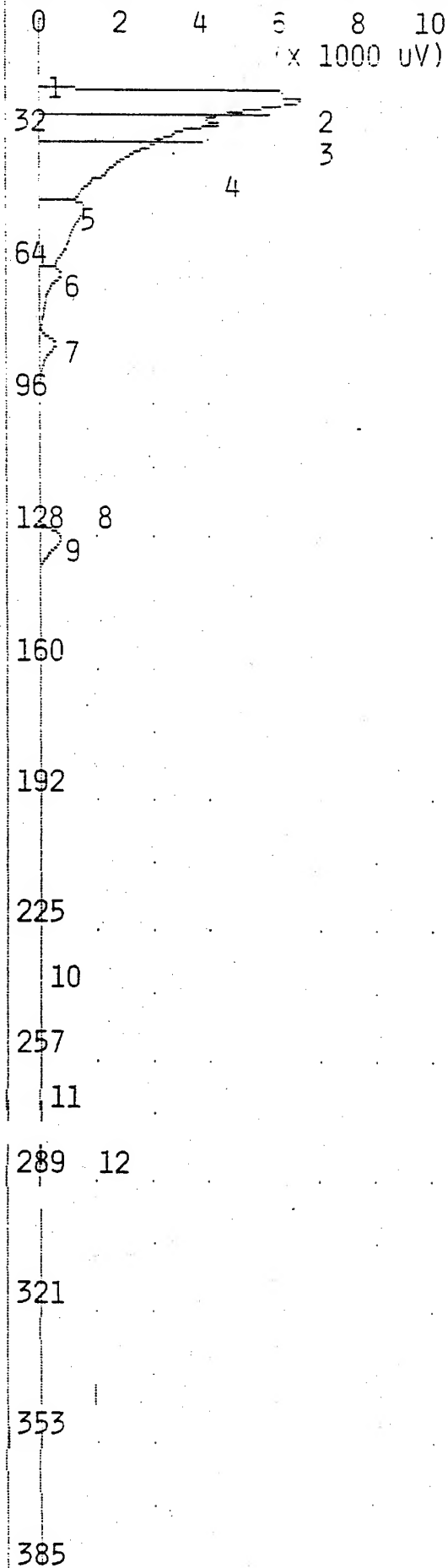
ANALYSIS TIME 450.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.024 MVS	16.2
2	UNKNOWN	5.093 MVS	18.5
3	UNKNOWN	4.879 MVS	19.9
4	UNKNOWN	11.66 MVS	21.2
5	UNKNOWN	24.61 MVS	26.2
6	UNKNOWN	1.683 MVS	47.2
7	UNKNOWN	2.792 MVS	79.2
8	TOLUENE	9.145 PPB	126.2
9	UNKNOWN	2.044 MVS	233.4
10	ETHYLBENZENE	5.341 PPB	261.6
11	M,P-XYLENE	5.740 PPB	280.0

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK



TIME PRINTED: MAY 16,95 09:31

SAMPLE TIME: MAY 16,95 09:23

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 11 ML/MIN
B/F FLOW 11 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000
ANALYSIS TIME 450.0 SEC

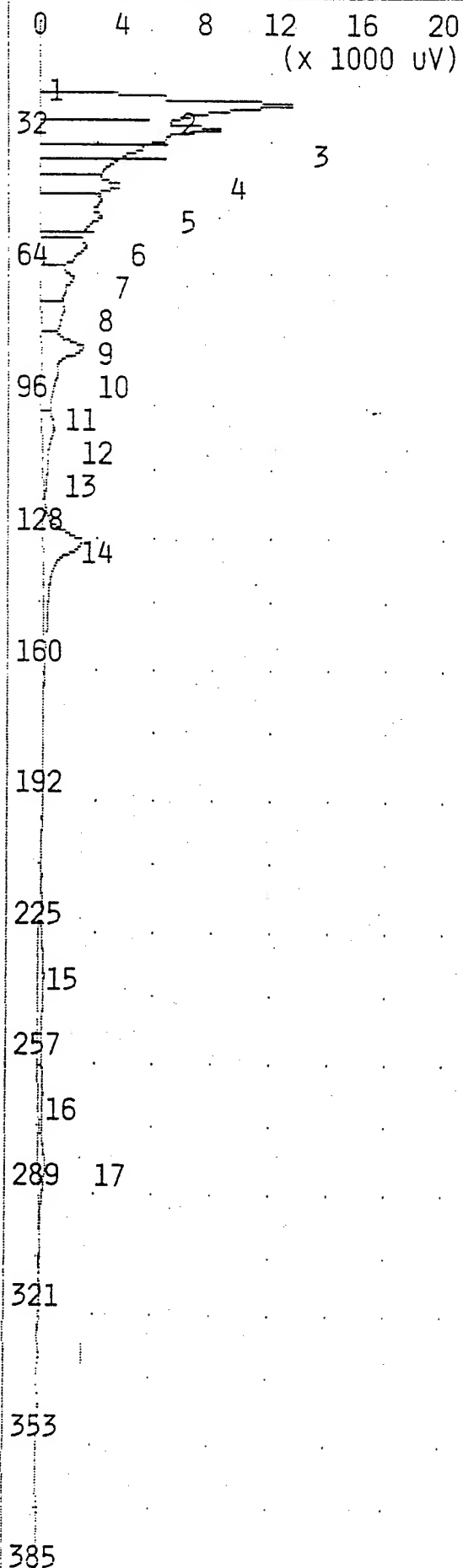
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.034 MVS	16.4
2	UNKNOWN	9.450 MVS	18.4
3	UNKNOWN	35.21 MVS	20.4
4	UNKNOWN	47.42 MVS	26.4
5	UNKNOWN	14.86 MVS	47.4
6	BENZENE	2.024 PPB	63.4
7	UNKNOWN	3.477 MVS	79.4
8	UNKNOWN	0.332 MVS	115.4
9	TOLUENE	5.726 PPB	127.4
10	UNKNOWN	1.940 MVS	235.6
11	ETHYLBENZENE	1.140 PPB	264.8
12	M,P-XYLENE	3.136 PPB	282.9

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-007BH

0.5- 2.5 10G



TIME PRINTED: MAY 16,95 09:42

SAMPLE TIME: MAY 16,95 09:35

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 11 ML/MIN
B/F FLOW 11 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000
ANALYSIS TIME 450.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.030 MVS	14.4
2	UNKNOWN	8.287 MVS	18.7
3	UNKNOWN	55.67 MVS	20.9
4	UNKNOWN	23.76 MVS	26.8
5	UNKNOWN	44.73 MVS	29.3
6	UNKNOWN	15.75 MVS	40.8
7	UNKNOWN	11.21 MVS	44.5
8	UNKNOWN	18.55 MVS	48.4
9	UNKNOWN	12.59 MVS	55.8
10	BENZENE	4.591 PPB	63.0
11	UNKNOWN	7.745 MVS	70.8
12	UNKNOWN	18.79 MVS	80.0
13	UNKNOWN	7.600 MVS	100.1
14	TOLUENE	12.05 PPB	127.6
15	UNKNOWN	11.62 MVS	229.2
16	ETHYLBENZENE	4.553 PPB	263.7
17	M,P-XYLENE	13.86 PPB	280.8

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-007BH
5.0- 7.0 10G

ANALYSIS #7

10S+ GC FUNCTION ANALYSIS REPORT

0 4 8 12 16 20
(x 1000 UV)

TIME PRINTED: MAY 16,95 09:53

SAMPLE TIME: MAY 16,95 09:46

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 11 ML/MIN
B/F FLOW 11 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000
ANALYSIS TIME 450.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	8.202 MVS	18.8
2	UNKNOWN	52.16 MVS	20.6
3	UNKNOWN	78.47 MVS	26.8
4	UNKNOWN	0.281 MVS	40.2
5	UNKNOWN	1.207 MVS	45.6
6	UNKNOWN	27.46 MVS	48.0
7	BENZENE	3.721 PPB	63.5
8	UNKNOWN	6.346 MVS	79.6
9	TOLUENE	3.690 PPB	127.2
10	UNKNOWN	4.395 MVS	230.4
11	ETHYLBENZENE	0.293 PPB	263.7

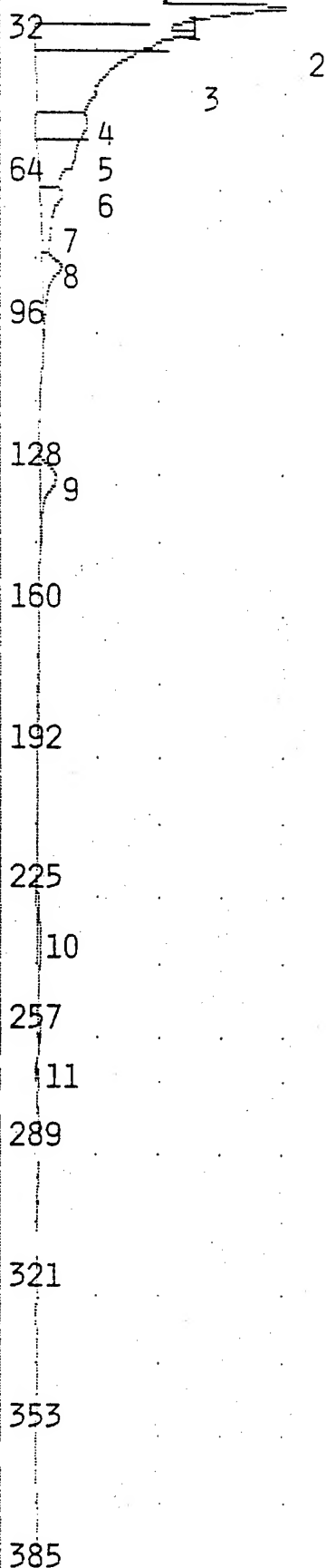
NOTES

JOE BYRD, JR.

DULUTH ANGB

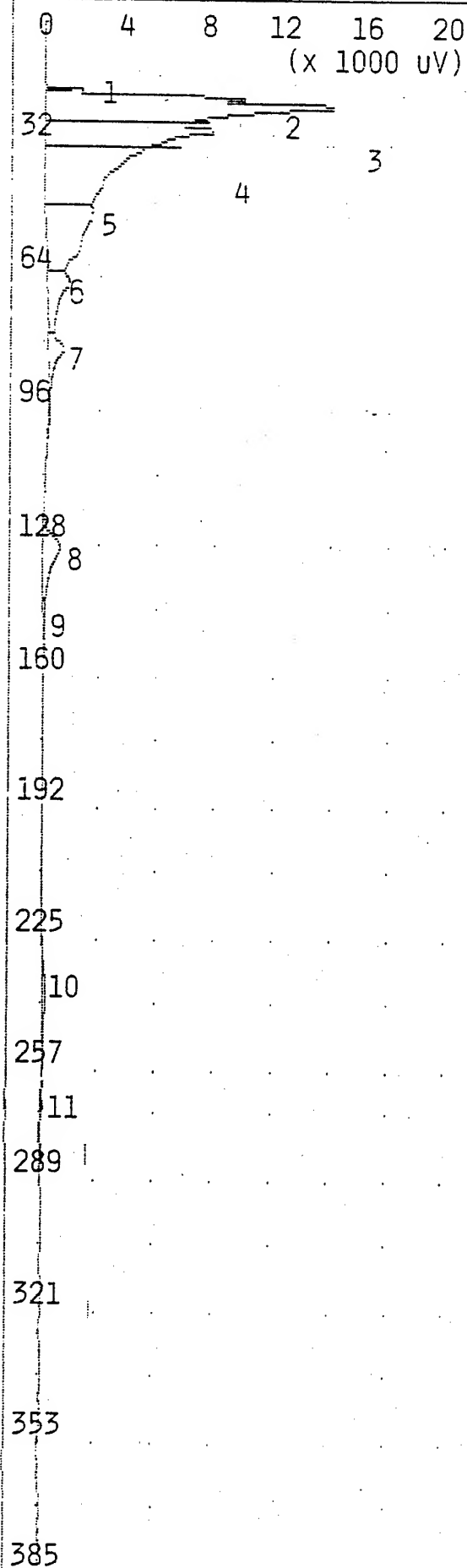
025-007BH

10.0-12.0 10G



ANALYSIS #8

10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 16,95 10:04

SAMPLE TIME: MAY 16,95 09:57

METHOD

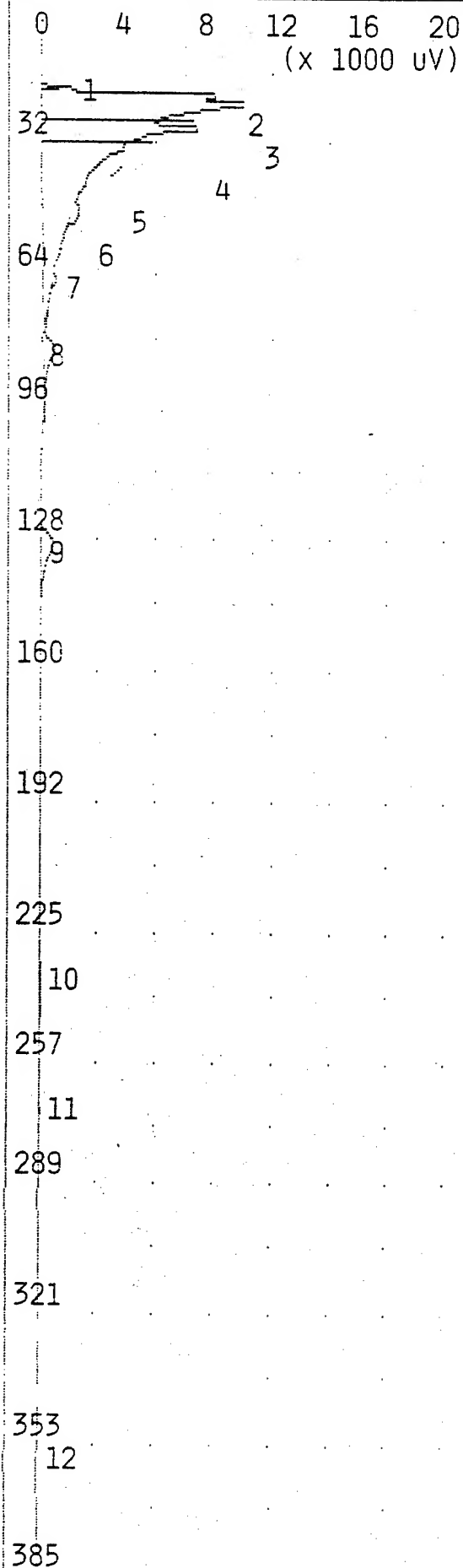
SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 11 ML/MIN
B/F FLOW 11 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 32 C
MAX GAIN 1000
ANALYSIS TIME 450.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	2.406 MVS	17.0
2	UNKNOWN	14.70 MVS	18.6
3	UNKNOWN	61.47 MVS	20.5
4	UNKNOWN	84.91 MVS	26.6
5	UNKNOWN	28.43 MVS	45.9
6	BENZENE	3.892 PPB	63.5
7	UNKNOWN	5.966 MVS	79.3
8	TOLUENE	10.87 PPB	126.9
9	UNKNOWN	8.209 MVS	140.9
10	UNKNOWN	3.239 MVS	234.6
11	ETHYLBENZENE	1.220 PPB	266.6

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-007BH
15.0-17.0 10G



TIME PRINTED: MAY 16,95 10:15

SAMPLE TIME: MAY 16,95 10:08

METHOD

SLOPE UP 0.500 MV/SEC
 SLOPE DOWN 1.500 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 11 ML/MIN
 B/F FLOW 11 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 32 C
 MAX GAIN 1000
 ANALYSIS TIME 450.0 SEC

PEAK REPORT

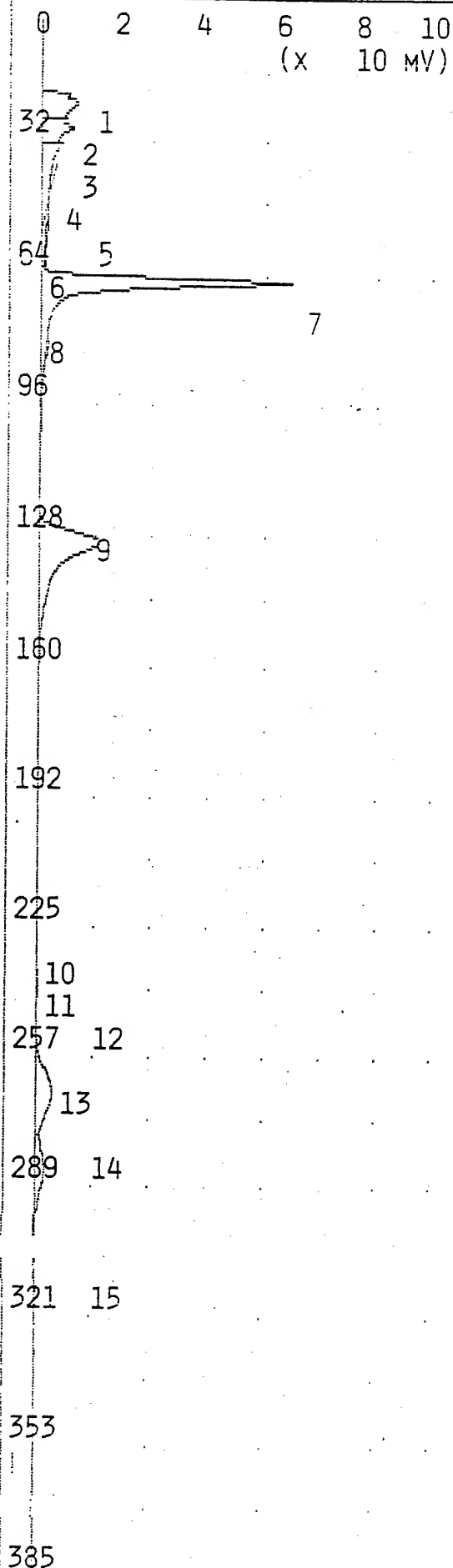
PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	1.758 MVS	17.0
2	UNKNOWN	14.10 MVS	18.6
3	UNKNOWN	46.77 MVS	20.7
4	UNKNOWN	96.10 MVS	26.6
5	UNKNOWN	0.429 MVS	31.6
6	UNKNOWN	1.834 MVS	45.7
7	BENZENE	0.073 PPB	63.1
8	UNKNOWN	4.684 MVS	80.1
9	TOLUENE	3.829 PPB	127.2
10	UNKNOWN	2.850 MVS	232.4
11	ETHYLBENZENE	0.917 PPB	266.6
12	O-XYLENE	20.52 PPB	354.0
13	UNKNOWN	6.573 MVS	408.3

NOTES

JOE BYRD, JR.
 DULUTH ANGB
 025-007BH
 20.0-22.0 10G

ANALYSIS #10

10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 16,95 10:26

SAMPLE TIME: MAY 16,95 10:19

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 11 ML/MIN
B/F FLOW 11 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 32 C
MAX GAIN 1000
ANALYSIS TIME 450.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	10.44 MVS	18.8
2	UNKNOWN	44.21 MVS	20.6
3	UNKNOWN	91.00 MVS	27.0
4	UNKNOWN	0.303 MVS	32.0
5	UNKNOWN	0.032 MVS	45.8
6	UNKNOWN	1.332 MVS	47.6
7	BENZENE	101.2 PPB	63.8
8	UNKNOWN	1.176 MVS	80.0
9	TOLUENE	82.93 PPB	127.8
10	UNKNOWN	0.119 MVS	229.0
11	UNKNOWN	0.557 MVS	236.0
12	UNKNOWN	1.248 MVS	239.0
13	ETHYLBENZENE	53.62 PPB	263.4
14	M,P-XYLENE	74.61 PPB	283.2
15	O-XYLENE	0.577 PPB	309.6

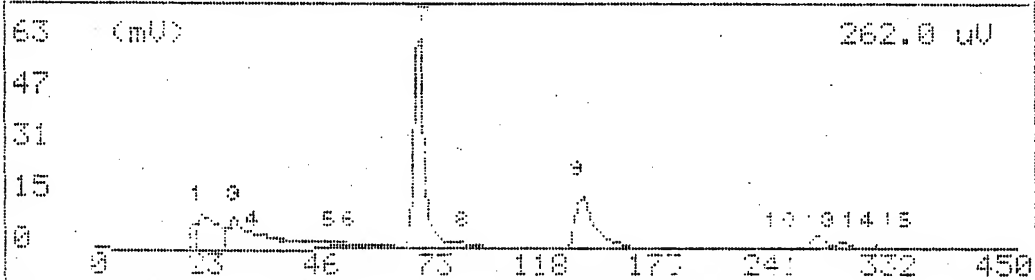
NOTES

JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX

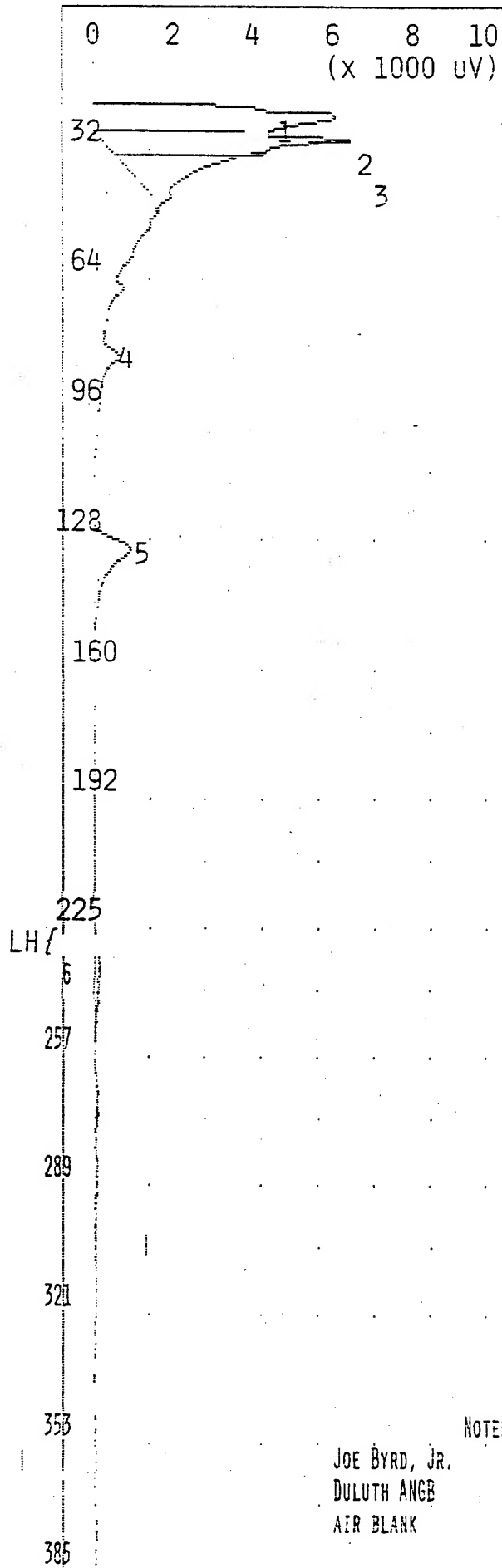
S.C. Ready 105- GC Function, Mar 13, 98 10:31
 -- Analysis No 10 -- Run at - Mar 13, 98 10:19 -

Pk No	Name	Conc/Area	Alarm	Ret. Time
7	benzene	100.0 ppb	-No-	63.0 sec
8	Unknown	1.176 mUS	-No-	66.0 sec
9	toluene	100.0 ppb	-No-	100.0 sec
10	Unknown	0.119 mUS	-No-	122.0 sec
11	Unknown	0.557 mUS	-No-	136.0 sec
12	Unknown	1.248 mUS	-No-	150.0 sec
13	ethylbenzene	100.0 ppb	-No-	160.4 sec
14	m,p-xylene	200.0 ppb	-No-	166.2 sec
15	o-xylene	100.0 ppb	-No-	169.0 sec

- Detected 15 peaks. Use ++ to scroll [455 sec]



ANALYSIS #11 10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 16,95 10:40

SAMPLE TIME: MAY 16,95 10:33

METHOD

SLOPE UP 1.500 MV/SEC
 SLOPE DOWN 4.500 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 11 ML/MIN
 B/F FLOW 11 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 32 C
 MAX GAIN 1000

ANALYSIS TIME 450.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	5.396 MVS	19.3
2	UNKNOWN	30.84 MVS	21.4
3	UNKNOWN	32.57 MVS	27.6
4	UNKNOWN	2.044 MVS	81.7
5	TOLUENE	5.320 PPB	128.8
6	UNKNOWN	1.942 MVS	234.2

NOTES

JOE BYRD, JR.
 DULUTH ANGB
 AIR BLANK

0 2 4 6 8 10
(x 1000 uV)

TIME PRINTED: MAY 16,95 10:52

SAMPLE TIME: MAY 16,95 10:44

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 11 ML/MIN
B/F FLOW 11 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 32 C
MAX GAIN 1000
ANALYSIS TIME 450.0 SEC

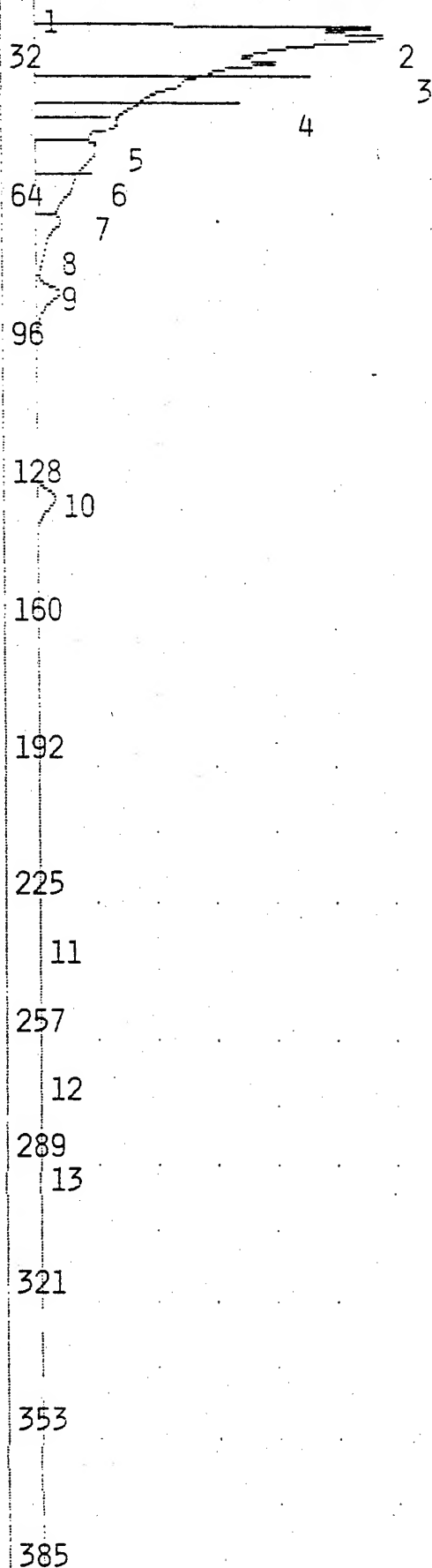
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.124 MVS	17.0
2	UNKNOWN	12.16 MVS	18.9
3	UNKNOWN	42.08 MVS	21.2
4	UNKNOWN	50.33 MVS	27.0
5	UNKNOWN	9.365 MVS	41.1
6	UNKNOWN	4.525 MVS	45.6
7	UNKNOWN	15.22 MVS	48.2
8	BENZENE	2.218 PPB	64.4
9	UNKNOWN	4.415 MVS	80.2
10	TOLUENE	3.665 PPB	127.7
11	UNKNOWN	2.179 MVS	233.4
12	ETHYLBENZENE	0.108 PPB	261.0
13	M,P-XYLENE	8.921 PPB	285.6

NOTES

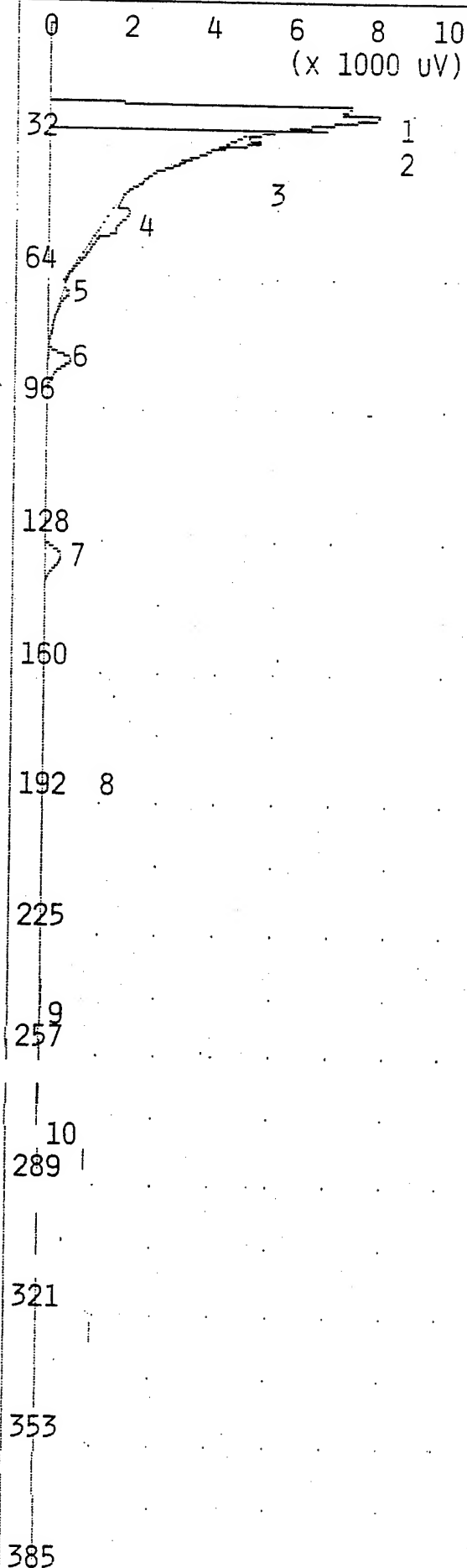
JOE BYRD, JR.
DULUTH ANGB
025-005BH

0.5- 2.5 10G



ANALYSIS #13

10S+ GC FUNCTION ANALYSIS REPORT

TIME PRINTED: MAY 16,95 11:03
SAMPLE TIME: MAY 16,95 10:55

METHOD

SLOPE UP	0.500	MV/SEC
SLOPE DOWN	1.500	MV/SEC
MIN AREA	0.000	MVSEC
MIN HEIGHT	0.000	MV
ANALYSIS DELAY	0.0	SEC
WINDOW PERCENT	10.0	%
DET FLOW	11	ML/MIN
B/F FLOW	11	ML/MIN
AUX FLOW	0	ML/MIN
OVEN TEMP	40	C
AMB TEMP	32	C
MAX GAIN	1000	
ANALYSIS TIME	450.0	SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	12.46 MVS	20.4
2	UNKNOWN	131.2 MVS	22.5
3	UNKNOWN	0.901 MVS	29.0
4	UNKNOWN	3.375 MVS	46.0
5	BENZENE	0.146 PPB	66.6
6	UNKNOWN	2.614 MVS	82.6
7	TOLUENE	3.560 PPB	129.6
8	UNKNOWN	31.51 MVS	185.4
9	UNKNOWN	16.89 MVS	237.6
10	ETHYLBENZENE	2.280 PPB	272.0

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-005BH
10.0-12.0

10G

ANALYSIS #14

10S+ GC FUNCTION ANALYSIS REPORT

0 4 8 12 16 20
(x 1000 uV)

TIME PRINTED: MAY 16,95 11:13

SAMPLE TIME: MAY 16,95 11:06

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 11 ML/MIN
B/F FLOW 11 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 32 C
MAX GAIN 1000
ANALYSIS TIME 450.0 SEC

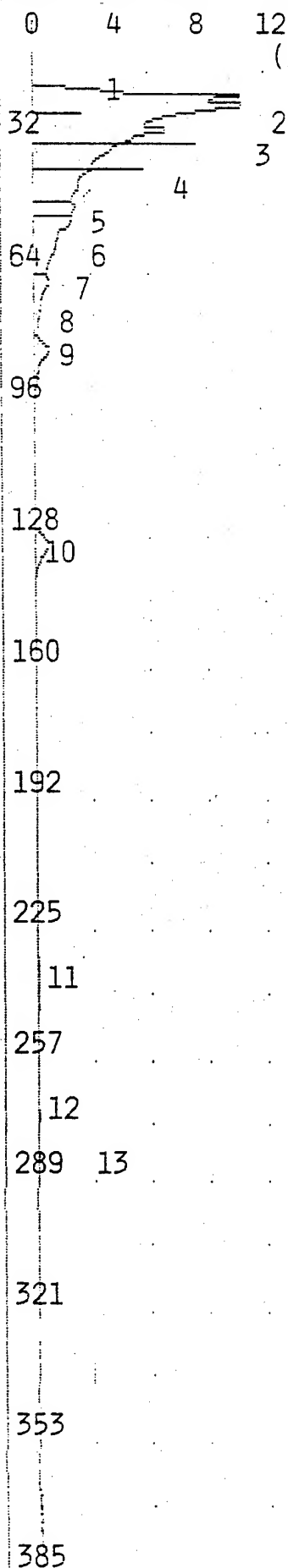
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	3.842 MVS	17.5
2	UNKNOWN	16.93 MVS	19.0
3	UNKNOWN	49.84 MVS	21.4
4	UNKNOWN	66.94 MVS	27.4
5	UNKNOWN	0.246 MVS	36.9
6	UNKNOWN	6.842 MVS	45.9
7	UNKNOWN	17.36 MVS	48.7
8	BENZENE	2.509 PPB	64.0
9	UNKNOWN	5.014 MVS	80.6
10	TOLUENE	4.305 PPB	128.0
11	UNKNOWN	3.062 MVS	235.2
12	ETHYLBENZENE	0.934 PPB	267.4
13	M,P-XYLENE	8.781 PPB	281.3

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-005BH
20.0-22.0

10G



ANALYSIS #15

10S+ GC FUNCTION ANALYSIS REPORT

0 2 4 6 8 10
(x 1000 UV)

TIME PRINTED: MAY 16, 95 11:49

SAMPLE TIME: MAY 16, 95 11:42

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 11 ML/MIN
B/F FLOW 11 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 32 C
MAX GAIN 1000
ANALYSIS TIME 450.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	11.13 MVS	19.2
2	UNKNOWN	124.8 MVS	21.2
3	UNKNOWN	0.611 MVS	27.4
4	UNKNOWN	2.818 MVS	45.8
5	BENZENE	0.068 PPB	63.2
6	UNKNOWN	2.953 MVS	80.6
7	TOLUENE	3.688 PPB	128.5
8	UNKNOWN	2.329 MVS	235.4
9	ETHYLBENZENE	0.387 PPB	269.3

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-004BH
0.5- 2.5 10G

ANALYTIC #16 10S+ GC FUNCTION ANALYSIS REPORT

0 4 8 12 16 20
(x 1000 UV)

TIME PRINTED: MAY 16, 95 12:00

SAMPLE TIME: MAY 16, 95 11:53

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 11 ML/MIN
B/F FLOW 11 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 32 C
MAX GAIN 1000
ANALYSIS TIME 450.0 SEC

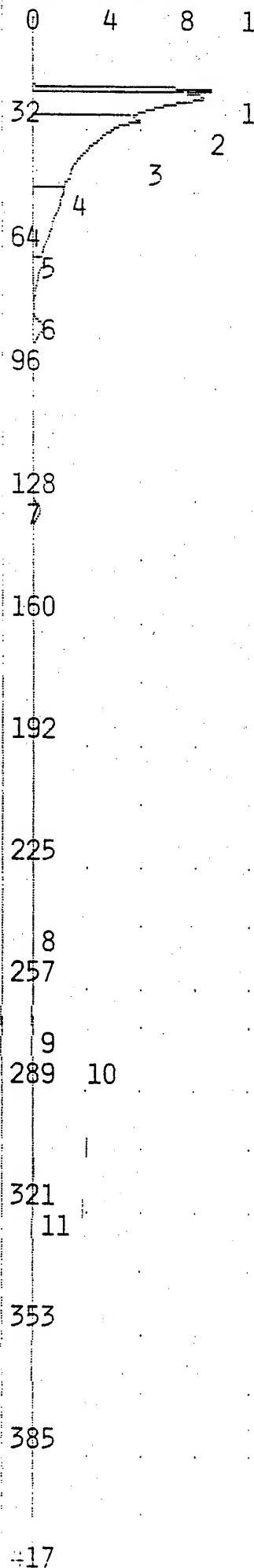
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	15.08 MVS	19.4
2	UNKNOWN	46.38 MVS	21.5
3	UNKNOWN	61.38 MVS	27.6
4	UNKNOWN	21.83 MVS	46.4
5	BENZENE	2.193 PPB	64.1
6	UNKNOWN	4.145 MVS	80.9
7	TOLUENE	3.670 PPB	128.2
8	UNKNOWN	11.97 MVS	237.2
9	ETHYLBENZENE	9.949 PPB	268.5
10	M,P-XYLENE	177.7 PPB	283.4
11	O-XYLENE	156.5 PPB	319.7

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-004BH

5.0- 7.0 10G



0 2 4 6 8 10
(x 10 MV)

TIME PRINTED: MAY 16,95 15:38

SAMPLE TIME: MAY 16,95 15:30

METHOD

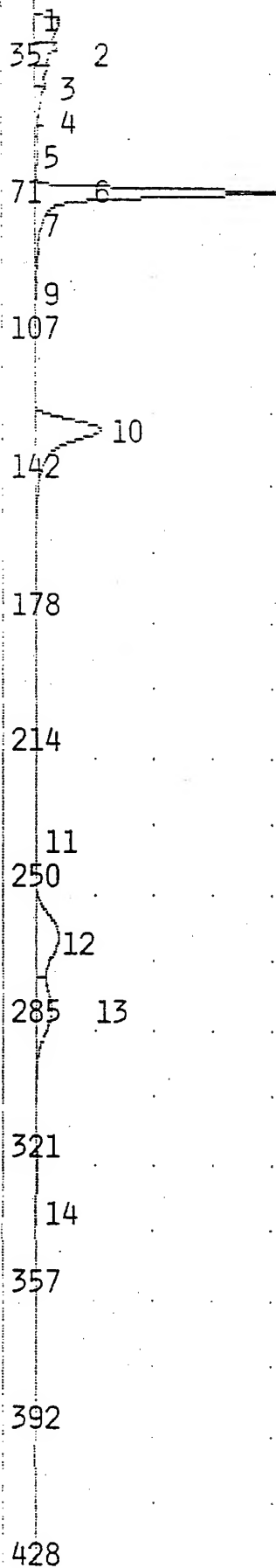
SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 32 C
MAX GAIN 1000
ANALYSIS TIME 500.0 SEC

PEAK REPORT

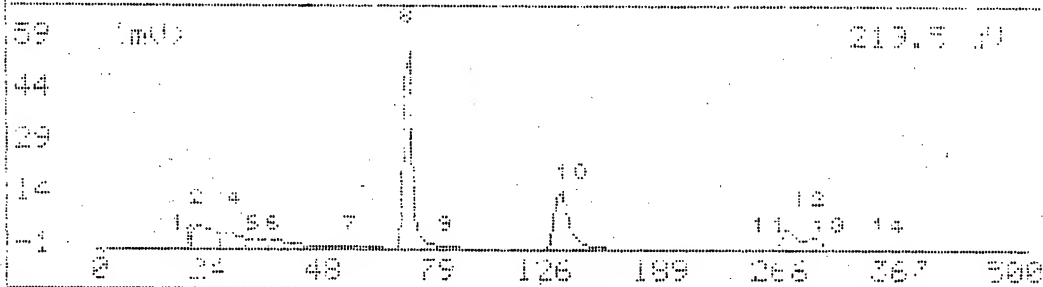
PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.050 MVS	16.6
2	UNKNOWN	8.773 MVS	18.7
3	UNKNOWN	32.01 MVS	20.3
4	UNKNOWN	22.56 MVS	26.8
5	UNKNOWN	12.13 MVS	32.0
6	UNKNOWN	25.04 MVS	36.3
7	UNKNOWN	9.629 MVS	51.0
8	UNKNOWN	201.0 MVS	64.2
9	UNKNOWN	0.299 MVS	80.0
10	UNKNOWN	130.8 MVS	126.1
11	UNKNOWN	0.086 MVS	230.2
12	UNKNOWN	79.92 MVS	258.4
13	UNKNOWN	58.90 MVS	277.8
14	UNKNOWN	9.116 MVS	324.5

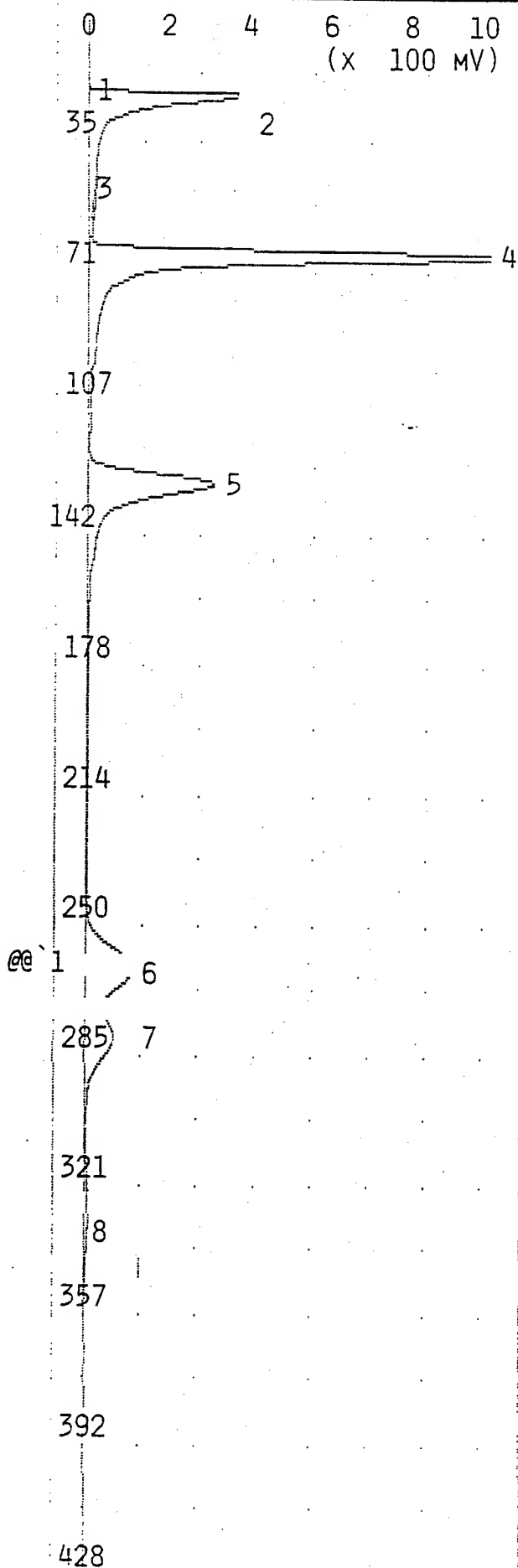
NOTES

JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX



S.C. ready Plot+BC Function May 13, 95 15:46
 -- Analysis No 18 -- Run at -- May 18, 95 15:20 --
 PK No Name Conc/Area Alarm Ret. Time
 8 Unknown 25.04 mVg -No- 20.0 sec
 9 Unknown 9.529 mVg -No- 31.0 sec
 10 benzene 100.0 ppb -No- 34.2 sec
 11 Unknown 0.199 mVg -No- 60.0 sec
 12 toluene 100.0 ppb -No- 61.1 sec
 13 Unknown 0.386 mVg -No- 63.2 sec
 14 ethyl benzene 100.0 ppb -No- 250.1 sec
 15 m,p-xylene 200.0 ppb -No- 277.0 sec
 16 o-xylene 100.0 ppb -No- 324.0 sec
 17 Detector: 14 peaks. Use + - to scroll [265 sec]





TIME PRINTED: MAY 16,95 15:56

SAMPLE TIME: MAY 16,95 15:48

METHOD

SLOPE UP 0.500 MV/SEC

SLOPE DOWN 1.500 MV/SEC

MIN AREA 0.000 MVSEC

MIN HEIGHT 0.000 MV

ANALYSIS DELAY 0.0 SEC

WINDOW PERCENT 10.0 %

DET FLOW 12 ML/MIN

B/F FLOW 12 ML/MIN

AUX FLOW 0 ML/MIN

OVEN TEMP 40 C

AMB TEMP 32 C

MAX GAIN 1000

ANALYSIS TIME 500.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.060 MVS	16.6
2	UNKNOWN	2.379 VSEC	20.4
3	UNKNOWN	30.14 MVS	43.2
4	BENZENE	2.803 PPM	64.6
5	TOLUENE	2.327 PPM	126.5
6	ETHYLBENZENE	2.108 PPM	259.4
7	M,P-XYLENE	3.727 PPM	278.4
8	O-XYLENE	3.723 PPM	325.8

NOTES

JOE BYRD, JR.
DULUTH ANGB
1 PPM BTEX

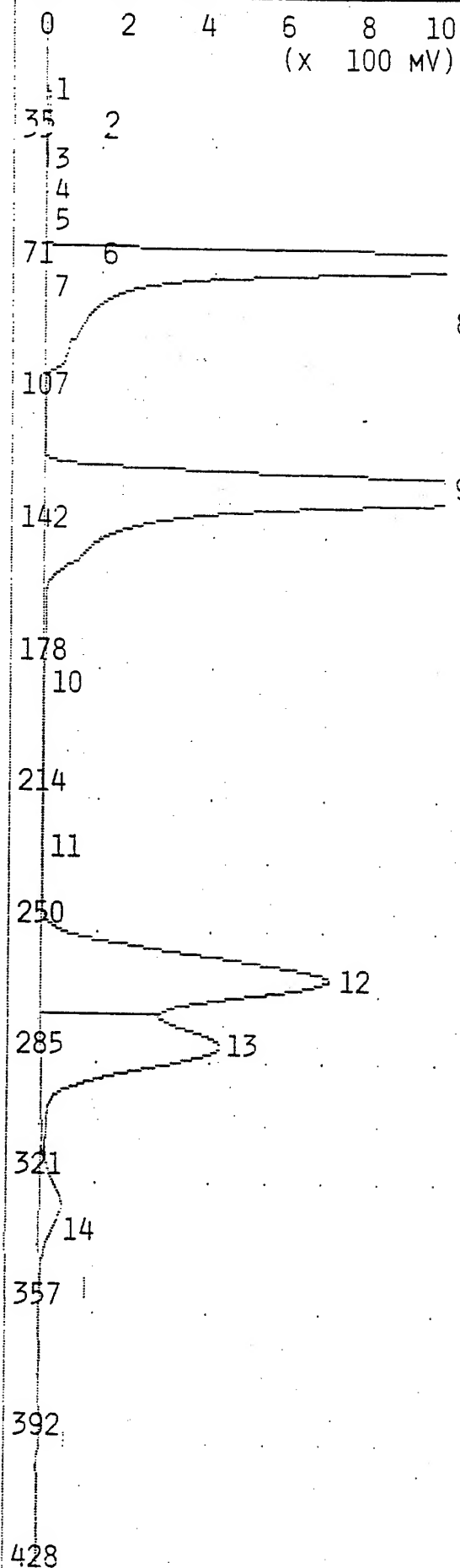
[illegible]

1. **Detected Peaks:**

Peak Number	Retention Time (min)	Approximate Relative Intensity (%)
1	~1.5	~10
2	~2.5	~15
3	~3.5	~10
4	~4.5	~10
5	~5.5	~10
6	~6.5	~10
7	~7.5	~10
8	~8.5	~10
9	~9.5	~10
10	~10.5	~10
11	~11.5	~10
12	~12.5	~10
13	~13.5	~10
14	~14.5	~10
15	~15.5	~10
16	~16.5	~10
17	~17.5	~10
18	~18.5	~10
19	~19.5	~10
20	~20.5	~10
21	~21.5	~10
22	~22.5	~10
23	~23.5	~10
24	~24.5	~10
25	~25.5	~10
26	~26.5	~10
27	~27.5	~10
28	~28.5	~10
29	~29.5	~10
30	~30.5	~10
31	~31.5	~10
32	~32.5	~10
33	~33.5	~10
34	~34.5	~10
35	~35.5	~10
36	~36.5	~10
37	~37.5	~10
38	~38.5	~10
39	~39.5	~10
40	~40.5	~10
41	~41.5	~10
42	~42.5	~10
43	~43.5	~10
44	~44.5	~10
45	~45.5	~10
46	~46.5	~10
47	~47.5	~10
48	~48.5	~10
49	~49.5	~10
50	~50.5	~10
51	~51.5	~10
52	~52.5	~10
53	~53.5	~10
54	~54.5	~10
55	~55.5	~10
56	~56.5	~10
57	~57.5	~10
58	~58.5	~10
59	~59.5	~10
60	~60.5	~10
61	~61.5	~10
62	~62.5	~10
63	~63.5	~10
64	~64.5	~10
65	~65.5	~10
66	~66.5	~10
67	~67.5	~10
68	~68.5	~10
69	~69.5	~10
70	~70.5	~10
71	~71.5	~10
72	~72.5	~10
73	~73.5	~10
74	~74.5	~10
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76	~76.5	~10
77	~77.5	~10
78	~78.5	~10
79	~79.5	~10
80	~80.5	~10
81	~81.5	~10
82	~82.5	~10
83	~83.5	~10
84	~84.5	~10
85	~85.5	~10
86	~86.5	~10
87	~87.5	~10
88	~88.5	~10
89	~89.5	~10
90	~90.5	~10
91	~91.5	~10
92	~92.5	~10
93	~93.5	~10
94	~94.5	~10
95	~95.5	~10
96	~96.5	~10
97	~97.5	~10
98	~98.5	~10
99	~99.5	~10
100	~100.5	~10

2. **Mass Spectrum:**

The mass spectrum displays relative intensity on the y-axis (0 to 100) and m/z on the x-axis (0 to 120). The base peak is at m/z 43. Other labeled peaks include m/z 15, 29, 41, 55, 69, 83, 97, and 111.



TIME PRINTED: MAY 16,95 16:11

SAMPLE TIME: MAY 16,95 16:02

METHOD

SLOPE UP 0.500 MV/SEC
 SLOPE DOWN 1.500 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 12 ML/MIN
 B/F FLOW 12 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 32 C
 MAX GAIN 1000
 ANALYSIS TIME 500.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.060 MVS	16.7
2	UNKNOWN	7.290 MVS	18.9
3	UNKNOWN	53.09 MVS	20.6
4	UNKNOWN	36.55 MVS	27.0
5	UNKNOWN	20.70 MVS	31.9
6	UNKNOWN	38.02 MVS	36.4
7	UNKNOWN	11.98 MVS	50.9
8	BENZENE	3.009 PPM	65.2
9	TOLUENE	6.233 PPM	127.7
10	UNKNOWN	18.33 MVS	179.2
11	UNKNOWN	2.078 MVS	223.2
12	ETHYLBENZENE	5.917 PPM	260.2
13	M,P-XYLENE	11.75 PPM	278.4
14	O-XYLENE	3.681 PPM	325.3

NOTES

JOE BYRD, JR.
 DULUTH ANG3
 10 PPM BTEX

ANALYSIS #23 10S+ GC FUNCTION ANALYSIS REPORT

0 1 2 3 4 5
(x 1000 UV)TIME PRINTED: MAY 16, 95 16:26
SAMPLE TIME: MAY 16, 95 16:17

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 32 C
MAX GAIN 1000
ANALYSIS TIME 500.0 SEC

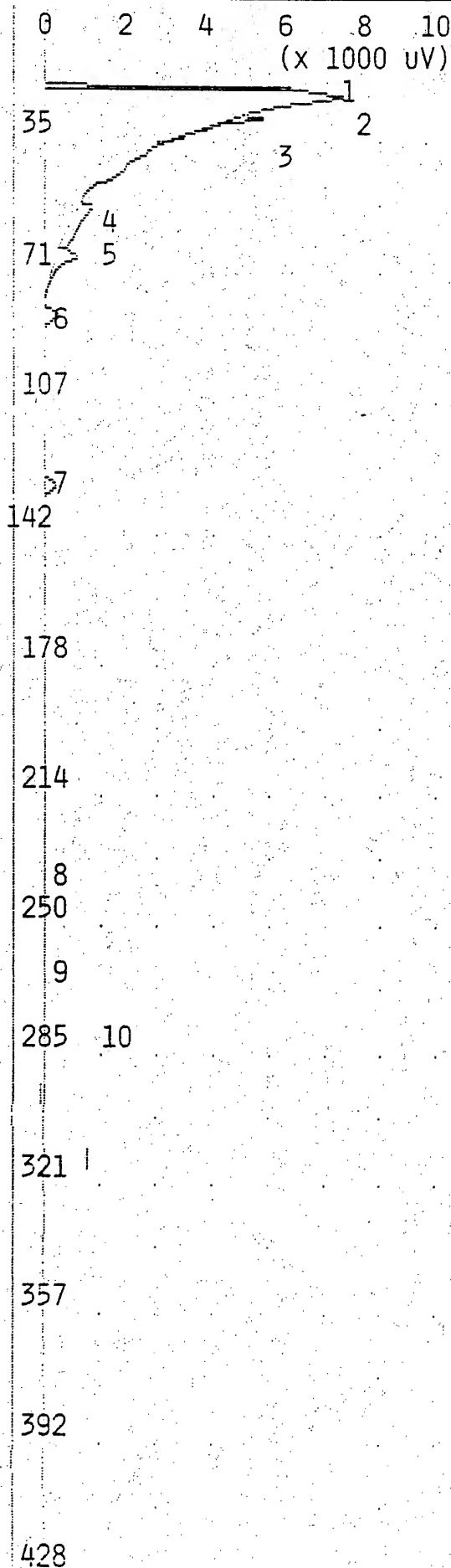
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.040 MVS	16.5
2	UNKNOWN	6.238 MVS	19.1
3	UNKNOWN	85.06 MVS	20.5
4	UNKNOWN	0.599 MVS	26.9
5	UNKNOWN	3.556 MVS	51.5
6	BENZENE	1.098 PPB	64.5
7	UNKNOWN	1.293 MVS	80.6
8	TOLUENE	0.887 PPB	126.9
9	UNKNOWN	0.162 MVS	129.3
10	UNKNOWN	0.658 MVS	229.8
11	ETHYLBENZENE	6.002 PPB	261.0
12	M,P-XYLENE	8.717 PPB	278.4

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK

ANALYSIS #24 10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 16,95 16:38
SAMPLE TIME: MAY 16,95 16:30

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000
ANALYSIS TIME 500.0 SEC

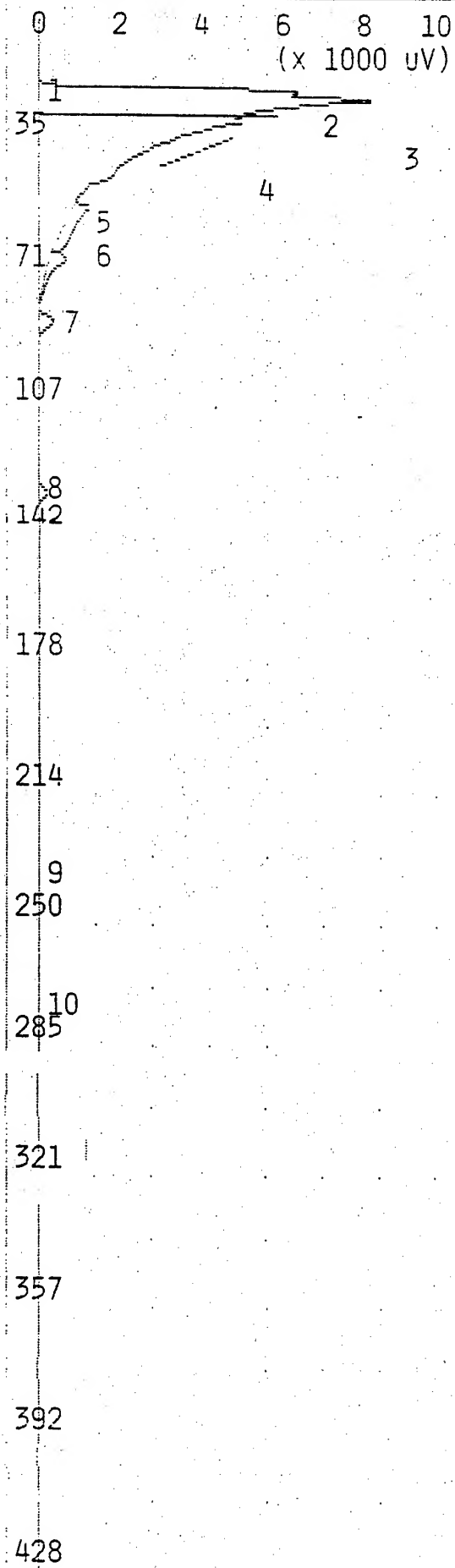
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	9.815 MVS	19.1
2	UNKNOWN	129.2 MVS	20.9
3	UNKNOWN	1.162 MVS	27.1
4	UNKNOWN	3.264 MVS	51.0
5	BENZENE	1.026 PPB	64.6
6	UNKNOWN	1.713 MVS	81.0
7	TOLUENE	4.015 PPB	127.0
8	UNKNOWN	9.807 MVS	231.2
9	ETHYLBENZENE	4.295 PPB	260.5
10	M,P-XYLENE	8.423 PPB	278.4

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-004BH
10.0-12.0 10G

ANALYSIS #25 10S+ GC FUNCTION ANALYSIS REPORT

TIME PRINTED: MAY 16, 95 16:51
SAMPLE TIME: MAY 16, 95 16:43

METHOD

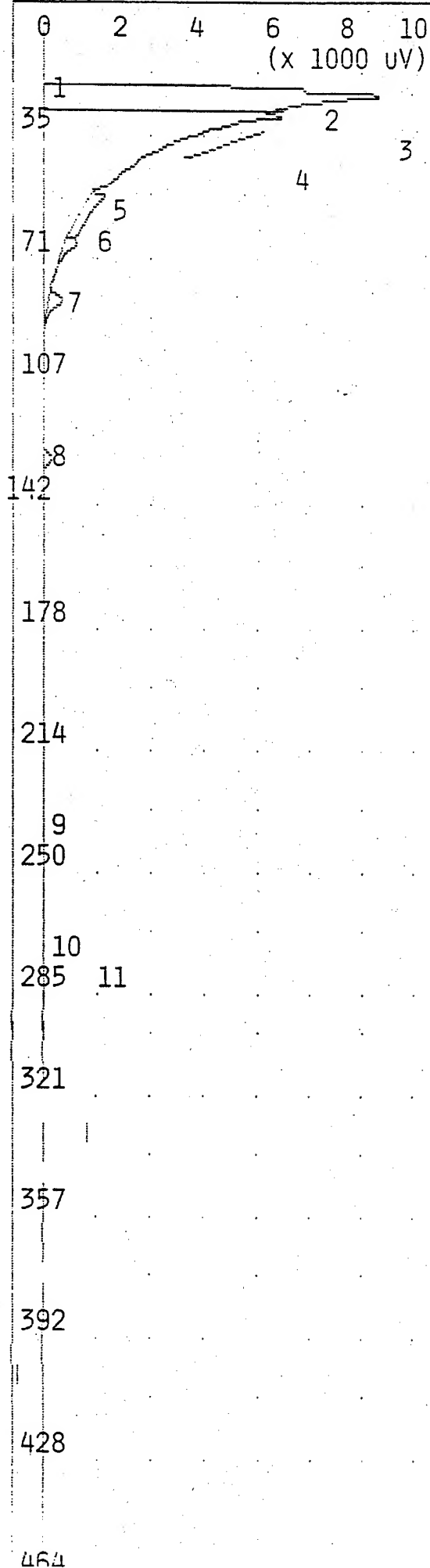
SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000
ANALYSIS TIME 500.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.354 MVS	17.6
2	UNKNOWN	10.22 MVS	19.3
3	UNKNOWN	127.6 MVS	21.6
4	UNKNOWN	1.419 MVS	27.4
5	UNKNOWN	3.965 MVS	51.0
6	BENZENE	0.823 PPB	65.0
7	UNKNOWN	1.873 MVS	81.4
8	TOLUENE	3.459 PPB	127.7
9	UNKNOWN	1.753 MVS	232.8
10	ETHYLBENZENE	0.258 PPB	264.0

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-0043H
18.0-20.0 10G



TIME PRINTED: MAY 16, 95 17:27

SAMPLE TIME: MAY 16, 95 17:19

METHOD

SLOPE UP 0.500 MV/SEC
 SLOPE DOWN 1.500 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 12 ML/MIN
 B/F FLOW 12 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 31 C
 MAX GAIN 1000
 ANALYSIS TIME 500.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.095 MVS	17.4
2	UNKNOWN	10.08 MVS	19.3
3	UNKNOWN	153.9 MVS	21.4
4	UNKNOWN	1.521 MVS	27.6
5	UNKNOWN	3.825 MVS	51.0
6	BENZENE	0.627 PPB	65.0
7	UNKNOWN	1.483 MVS	81.0
8	TOLUENE	2.780 PPB	127.3
9	UNKNOWN	2.663 MVS	231.4
10	ETHYLBENZENE	1.715 PPB	264.0
11	M,P-XYLENE	5.519 PPB	278.9

NOTES

JOE BYRD, JR.
 DULUTH ANGB
 025-004BH RESHOT
 5.0- 7.0 10G

0 2 4 6 8 10
(X 10 MV)

TIME PRINTED: MAY 16,95 17:39

SAMPLE TIME: MAY 16,95 17:31

METHOD

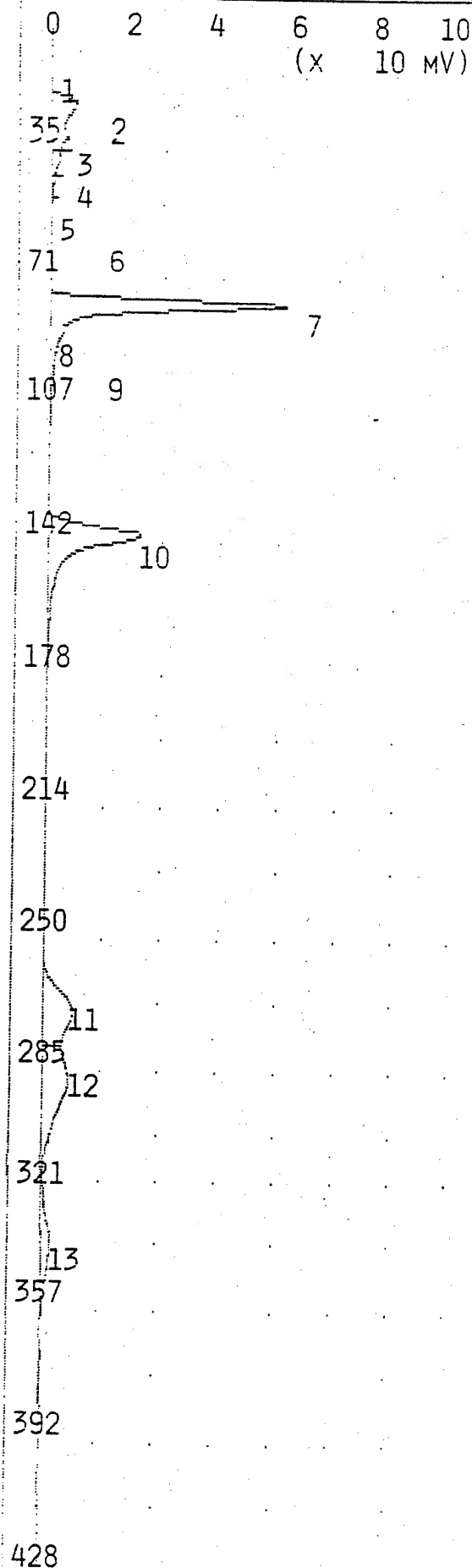
SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000
ANALYSIS TIME 500.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.059 MVS	16.9
2	UNKNOWN	10.52 MVS	19.2
3	UNKNOWN	52.81 MVS	21.0
4	UNKNOWN	37.52 MVS	27.6
5	UNKNOWN	57.25 MVS	32.6
6	UNKNOWN	19.65 MVS	51.1
7	BENZENE	106.2 PPB	65.2
8	UNKNOWN	0.651 MVS	80.6
9	TOLUENE	103.2 PPB	127.0
10	UNKNOWN	1.272 MVS	231.2
11	ETHYLBENZENE	98.22 PPB	259.2
12	M,P-XYLENE	188.0 PPB	278.1
13	O-XYLENE	68.30 PPB	324.2

NOTES

JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX



TIME PRINTED: MAY 17,95 08:06

SAMPLE TIME: MAY 17,95 07:57

METHOD

SLOPE UP 0.500 MV/SEC
 SLOPE DOWN 1.500 MV/SEC
 MIN AREA 0.000 MVSEC
 MIN HEIGHT 0.000 MV
 ANALYSIS DELAY 0.0 SEC
 WINDOW PERCENT 10.0 %
 DET FLOW 12 ML/MIN
 B/F FLOW 12 ML/MIN
 AUX FLOW 0 ML/MIN
 OVEN TEMP 40 C
 AMB TEMP 29 C
 MAX GAIN 1000
 ANALYSIS TIME 500.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.097 MVS	18.6
2	UNKNOWN	8.173 MVS	20.9
3	UNKNOWN	35.18 MVS	22.6
4	UNKNOWN	19.48 MVS	29.8
5	UNKNOWN	18.64 MVS	35.6
6	UNKNOWN	0.398 MVS	54.6
7	UNKNOWN	277.1 MVS	76.5
8	UNKNOWN	2.155 MVS	84.0
9	UNKNOWN	0.483 MVS	93.4
10	UNKNOWN	182.4 MVS	138.5
11	UNKNOWN	107.3 MVS	267.2
12	UNKNOWN	130.4 MVS	285.6
13	UNKNOWN	48.03 MVS	337.3

NOTES

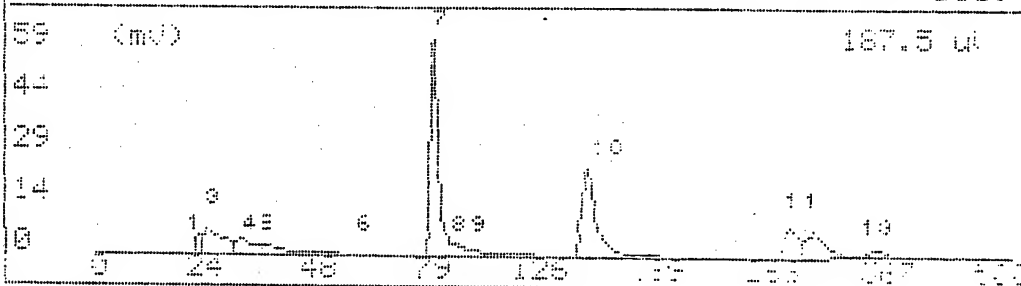
JOE BYRD, JR.
 DULUTH ANGB
 100 PPB BTEX

E.L. Ready 100+ GC Function

Analysis no 3 -- Run at 150°C

Peak No	Name	Conc/Area	Height	Area	Ret. Time
1	Unknown	18.64 mUS	1.00	1.00	0.00
2	Unknown	0.398 mUS	1.00	1.00	0.00
3	benzene	100.0 ppt	1.00	1.00	0.00
4	Unknown	2.155 mUS	1.00	1.00	0.00
5	Unknown	0.483 mUS	1.00	1.00	0.00
10	toluene	100.0 ppt	1.00	1.00	0.00
11	ethylbenzene	100.0 ppt	1.00	1.00	0.00
12	m,p-xylene	200.0 ppt	1.00	1.00	0.00
13	o-xylene	100.0 ppt	1.00	1.00	0.00

- Detected 13 peaks. Use + + to scroll. 1 0.00 sec.



0 2 4 6 8 10
(x 100 MV)

TIME PRINTED: MAY 17,95 08:23

SAMPLE TIME: MAY 17,95 08:15

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 30 C
MAX GAIN 1000
ANALYSIS TIME 500.0 SEC

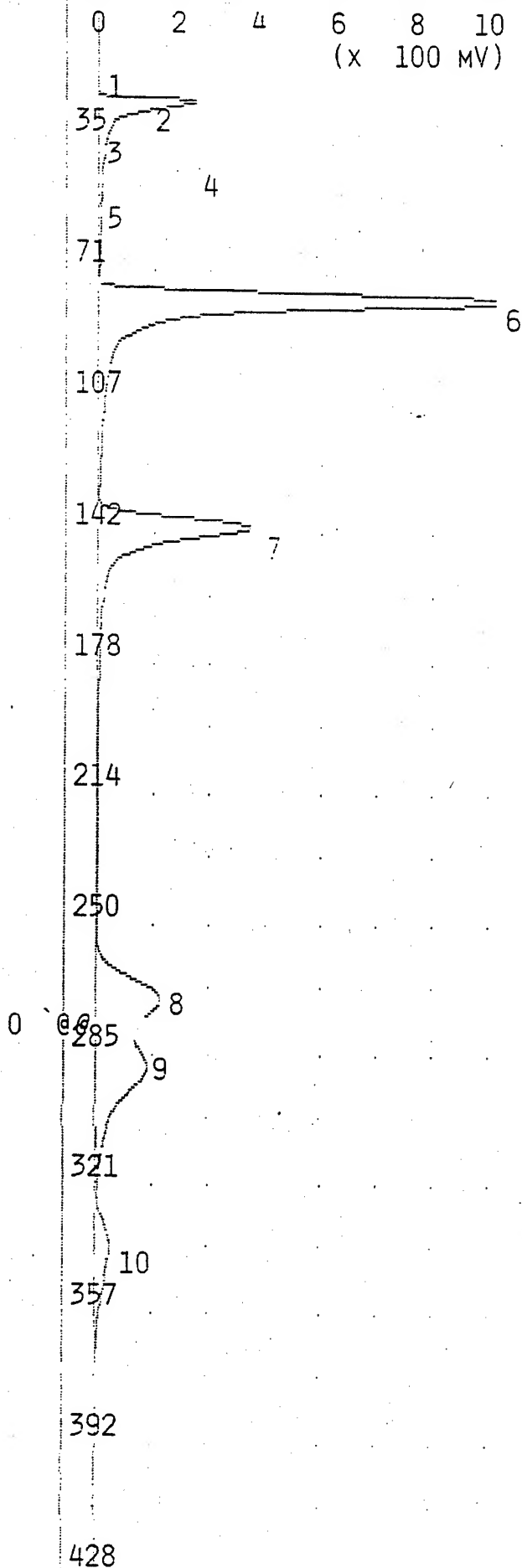
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.056 MVS	16.0
2	UNKNOWN	0.084 MVS	17.8
3	UNKNOWN	0.135 MVS	18.8
4	UNKNOWN	1.488 VSEC	23.0
5	UNKNOWN	0.596 MVS	47.8
6	BENZENE	2.734 PPM	77.2
7	TOLUENE	1.938 PPM	138.9
8	ETHYLBENZENE	2.221 PPM	268.2
9	M,P-XYLENE	3.749 PPM	286.6
10	O-XYLENE	2.084 PPM	337.3

NOTES

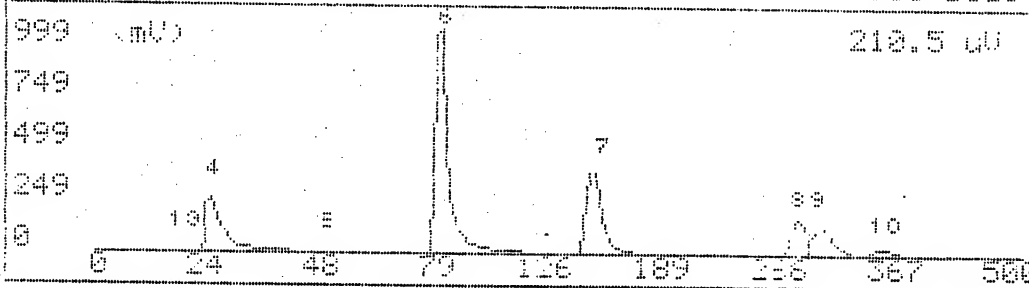
JOE BYRD, JR.
DULUTH ANGB

1 PPM BTEX



C. React. 1016 60 10/10/10
 Analysis No 4 Run at 10:10:10
 Pk No Name Conc Area

1	Unknown	0.00	1000
2	Unknown	0.00	1000
3	Unknown	0.00	1000
4	Unknown	0.00	1000
5	Unknown	0.00	1000
6	Unknown	0.00	1000
7	Unknown	0.00	1000
8	Unknown	0.00	1000
9	Unknown	0.00	1000
10	Unknown	0.00	1000
11	Unknown	0.00	1000
12	Unknown	0.00	1000
13	Unknown	0.00	1000
14	Unknown	0.00	1000
15	Unknown	0.00	1000
16	Unknown	0.00	1000
17	Unknown	0.00	1000
18	Unknown	0.00	1000
19	Unknown	0.00	1000
20	Unknown	0.00	1000
21	Unknown	0.00	1000
22	Unknown	0.00	1000
23	Unknown	0.00	1000
24	Unknown	0.00	1000
25	Unknown	0.00	1000
26	Unknown	0.00	1000
27	Unknown	0.00	1000
28	Unknown	0.00	1000
29	Unknown	0.00	1000
30	Unknown	0.00	1000
31	Unknown	0.00	1000
32	Unknown	0.00	1000
33	Unknown	0.00	1000
34	Unknown	0.00	1000
35	Unknown	0.00	1000
36	Unknown	0.00	1000
37	Unknown	0.00	1000
38	Unknown	0.00	1000
39	Unknown	0.00	1000
40	Unknown	0.00	1000
41	Unknown	0.00	1000
42	Unknown	0.00	1000
43	Unknown	0.00	1000
44	Unknown	0.00	1000
45	Unknown	0.00	1000
46	Unknown	0.00	1000
47	Unknown	0.00	1000
48	Unknown	0.00	1000
49	Unknown	0.00	1000
50	Unknown	0.00	1000
51	Unknown	0.00	1000
52	Unknown	0.00	1000
53	Unknown	0.00	1000
54	Unknown	0.00	1000
55	Unknown	0.00	1000
56	Unknown	0.00	1000
57	Unknown	0.00	1000
58	Unknown	0.00	1000
59	Unknown	0.00	1000
60	Unknown	0.00	1000
61	Unknown	0.00	1000
62	Unknown	0.00	1000
63	Unknown	0.00	1000
64	Unknown	0.00	1000
65	Unknown	0.00	1000
66	Unknown	0.00	1000
67	Unknown	0.00	1000
68	Unknown	0.00	1000
69	Unknown	0.00	1000
70	Unknown	0.00	1000
71	Unknown	0.00	1000
72	Unknown	0.00	1000
73	Unknown	0.00	1000
74	Unknown	0.00	1000
75	Unknown	0.00	1000
76	Unknown	0.00	1000
77	Unknown	0.00	1000
78	Unknown	0.00	1000
79	Unknown	0.00	1000
80	Unknown	0.00	1000
81	Unknown	0.00	1000
82	Unknown	0.00	1000
83	Unknown	0.00	1000
84	Unknown	0.00	1000
85	Unknown	0.00	1000
86	Unknown	0.00	1000
87	Unknown	0.00	1000
88	Unknown	0.00	1000
89	Unknown	0.00	1000
90	Unknown	0.00	1000
91	Unknown	0.00	1000
92	Unknown	0.00	1000
93	Unknown	0.00	1000
94	Unknown	0.00	1000
95	Unknown	0.00	1000
96	Unknown	0.00	1000
97	Unknown	0.00	1000
98	Unknown	0.00	1000
99	Unknown	0.00	1000
100	Unknown	0.00	1000



ANALYSIS #5

10S+ GC FUNCTION ANALYSIS REPORT

0 2 4 6 8 10
(x 100 MV)

TIME PRINTED: MAY 17,95 08:38

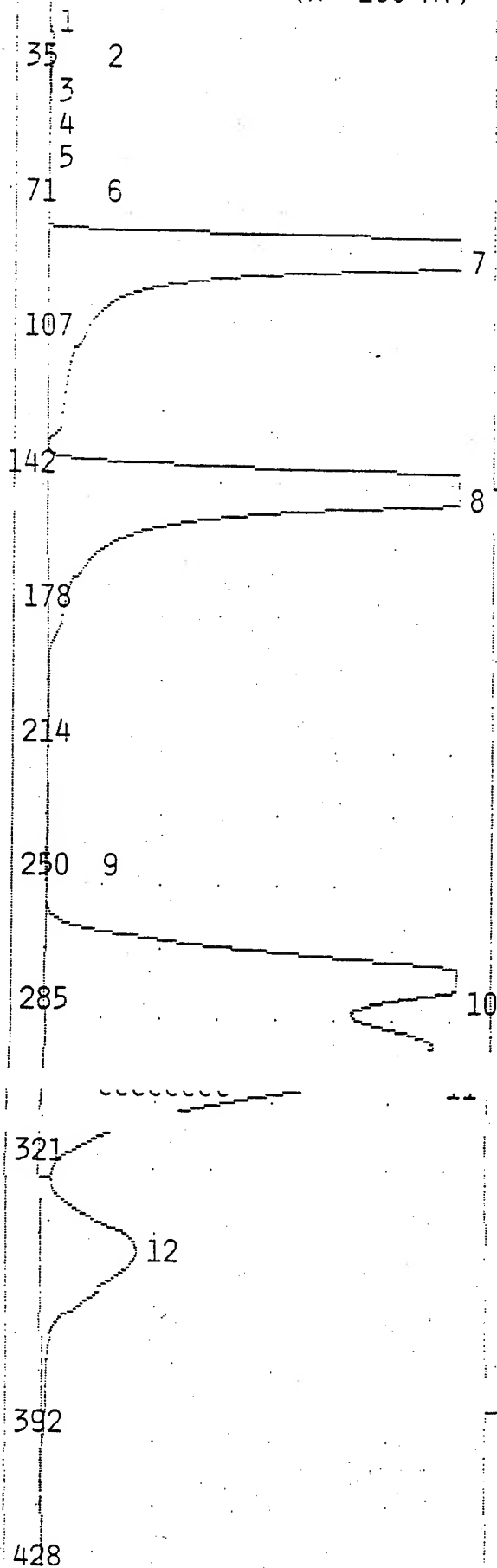
SAMPLE TIME: MAY 17,95 08:30

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 30 C
MAX GAIN 1000
ANALYSIS TIME 500.0 SEC

PEAK REPORT

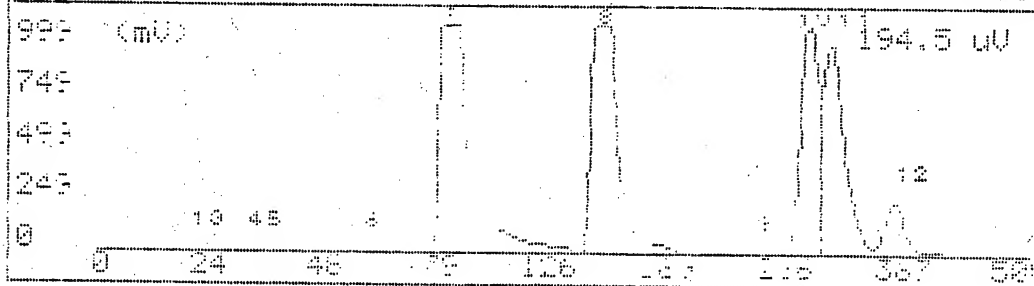
PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.052 MVS	18.8
2	UNKNOWN	5.132 MVS	21.4
3	UNKNOWN	54.13 MVS	23.1
4	UNKNOWN	34.81 MVS	30.4
5	UNKNOWN	34.36 MVS	36.0
6	UNKNOWN	0.103 MVS	55.3
7	BENZENE	3.956 PPM	79.8
8	TOLUENE	7.032 PPM	141.3
9	UNKNOWN	4.330 MVS	236.6
10	ETHYLBENZENE	7.386 PPM	272.2
11	M,P-XYLENE	14.38 PPM	289.8
12	O-XYLENE	5.601 PPM	341.0

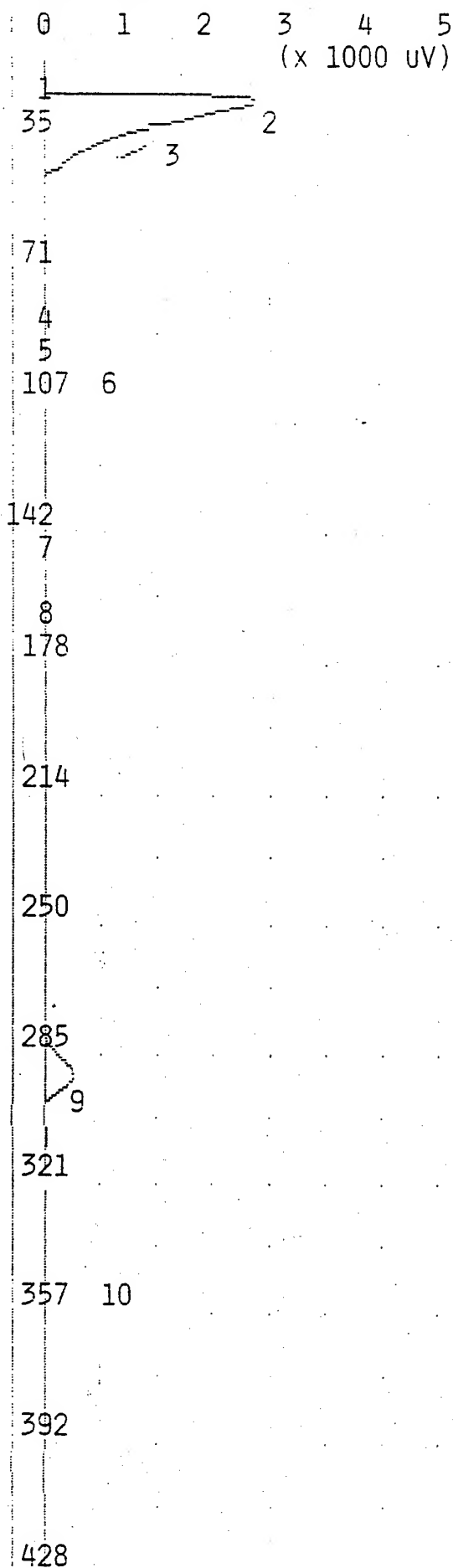


NOTES

JOE BYRD, JR.
DULUTH ANGB
10 PPM BTEX

G.C. Read		0.00		0.00		0.00	
Pne. No 5		Un at		No		0.00	
No	Name	Area	Area	Area	Area	Area	Area
1	Unknown	1.00	0.00	0.00	0.00	0.00	0.00
2	Unknown	1.00	0.00	0.00	0.00	0.00	0.00
3	Unknown	1.00	0.00	0.00	0.00	0.00	0.00
4	benzene	1.00	0.00	0.00	0.00	0.00	0.00
5	toluene	1.00	0.00	0.00	0.00	0.00	0.00
6	Unknown	1.00	0.00	0.00	0.00	0.00	0.00
7	ethylbenzene	1.00	0.00	0.00	0.00	0.00	0.00
8	m,p-xylene	1.00	0.00	0.00	0.00	0.00	0.00
9	o-xylene	1.00	0.00	0.00	0.00	0.00	0.00
- Detected 12 peaks. Un = + +							





TIME PRINTED: MAY 17,95 08:54

SAMPLE TIME: MAY 17,95 08:45

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 30 C
MAX GAIN 1000
ANALYSIS TIME 500.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.067 MVS	18.5
2	UNKNOWN	52.43 MVS	22.8
3	UNKNOWN	0.196 MVS	29.5
4	BENZENE	0.795 PPB	76.9
5	UNKNOWN	5.512 MVS	84.9
6	UNKNOWN	27.63 MVS	94.4
7	TOLUENE	11.98 PPB	140.6
8	UNKNOWN	5.801 MVS	161.0
9	M,P-XYLENE	83.47 PPB	289.8
10	O-XYLENE	19.58 PPB	347.0

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK

0 2 4 6 8 10
(X 10 MV)

TIME PRINTED: MAY 17, 95 10:06

SAMPLE TIME: MAY 17, 95 09:58

METHOD

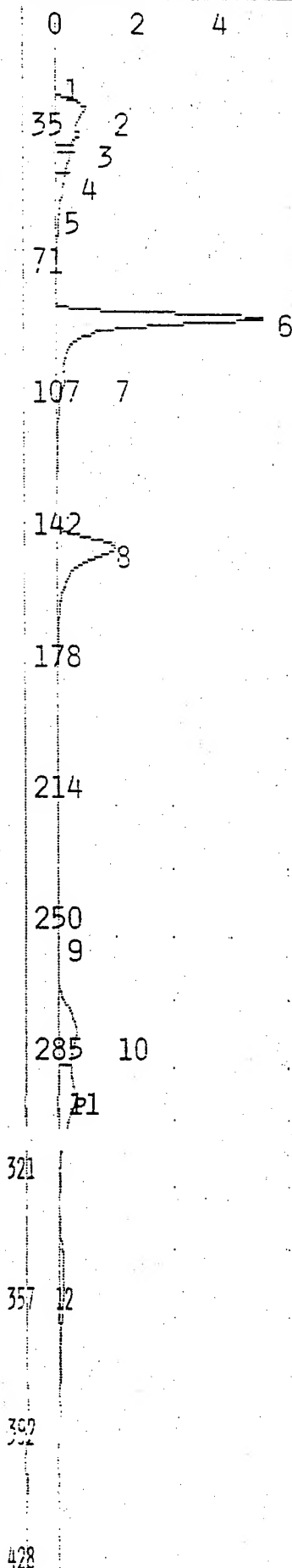
SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 29 C
MAX GAIN 1000
ANALYSIS TIME 500.0 SEC

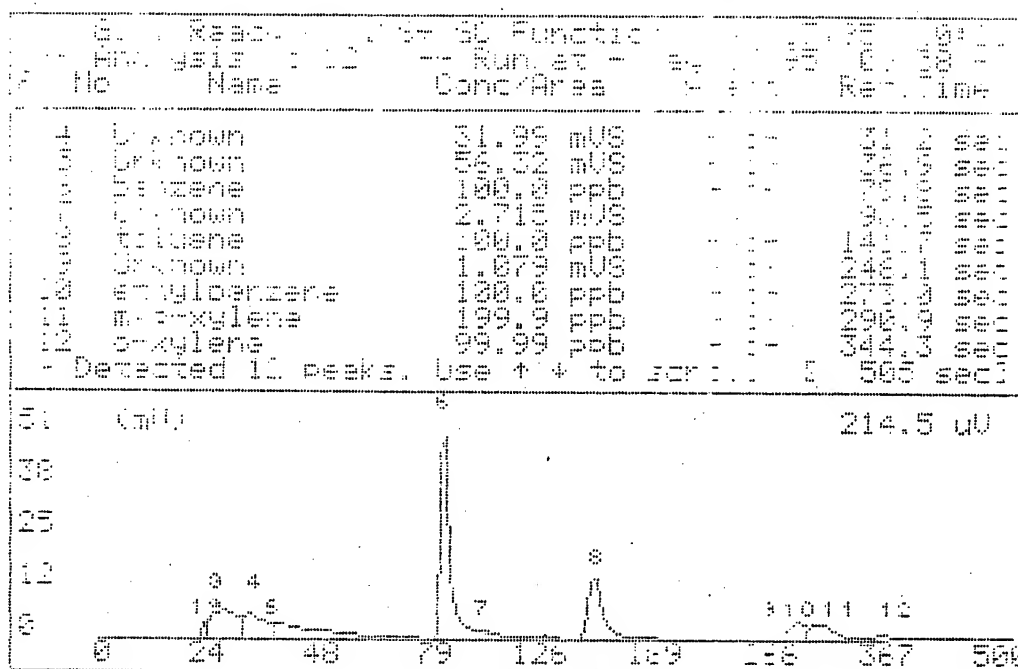
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.046 MVS	19.4
2	UNKNOWN	7.622 MVS	22.1
3	UNKNOWN	46.85 MVS	24.2
4	UNKNOWN	31.99 MVS	31.2
5	UNKNOWN	56.32 MVS	36.9
6	BENZENE	96.58 PPB	79.8
7	UNKNOWN	2.715 MVS	96.5
8	TOLUENE	70.20 PPB	141.7
9	UNKNOWN	1.079 MVS	246.1
10	ETHYLBENZENE	61.78 PPB	273.0
11	M,P-XYLENE	118.6 PPB	290.9
12	O-XYLENE	51.25 PPB	344.3

NOTES

JOE BARD, JR.
DULUTH - ANCS
100 FEE BTEX





ANALYSIS #13

10S+ GC FUNCTION ANALYSIS REPORT

0 2 4 6 8 10
(x 1000 UV)

TIME PRINTED: MAY 17,95 10:21

SAMPLE TIME: MAY 17,95 10:13

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 29 C
MAX GAIN 1000

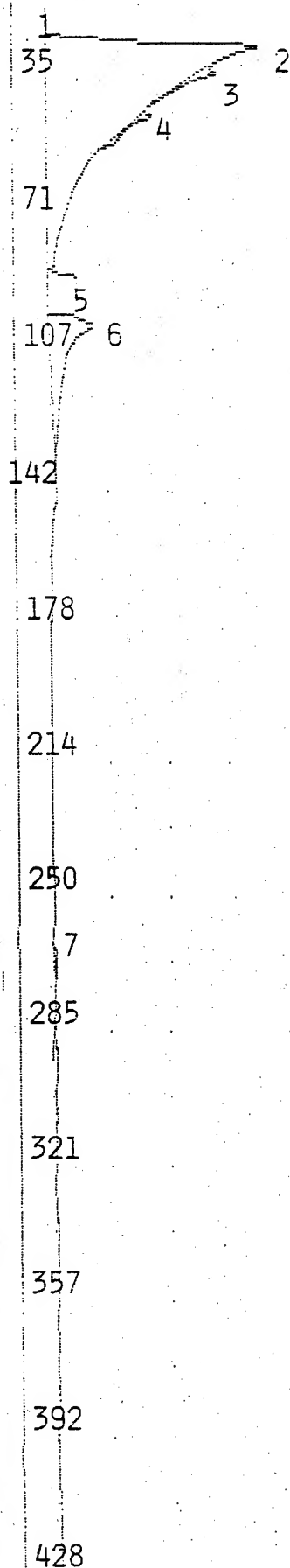
ANALYSIS TIME 500.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.077 MVS	19.7
2	UNKNOWN	119.7 MVS	24.4
3	UNKNOWN	0.911 MVS	31.4
4	UNKNOWN	1.426 MVS	42.8
5	BENZENE	2.879 PPB	85.3
6	UNKNOWN	13.61 MVS	97.3
7	ETHYLBENZENE	0.985 PPB	255.2

NOTES

JOE BYRD, JR.
DULUTH ANG
AIR BLANK



ANALYSIS #14

10S+ GC FUNCTION ANALYSIS REPORT

0 2 4 6 8 10
(X 10 MV)

TIME PRINTED: MAY 17,95 10:42

SAMPLE TIME: MAY 17,95 10:34

METHOD

SLOPE UP 0.500 M./SEC

SLOPE DOWN 1.500 M./SEC

MIN AREA 0.000 M.SEC

MIN HEIGHT 0.000 M.

ANALYSIS DELAY 0.0 SEC

WINDOW PERCENT 10.0 %

DET FLOW 12 M./MIN

B/F FLOW 12 M./MIN

AUX FLOW 0 M./MIN

OVEN TEMP 40 C

AMB TEMP 30 C

MAX GAIN 1000

ANALYSIS TIME 500.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.876 MVS	20.3
2	UNKNOWN	10.80 MVS	22.4
3	UNKNOWN	90.23 MVS	26.1
4	UNKNOWN	138.2 MVS	32.2
5	UNKNOWN	113.7 MVS	35.6
6	UNKNOWN	37.41 MVS	41.4
7	UNKNOWN	92.95 MVS	49.0
8	UNKNOWN	67.48 MVS	53.4
9	UNKNOWN	50.40 MVS	59.1
10	UNKNOWN	58.45 MVS	70.6
11	BENZENE	3.206 PPB	82.2
12	UNKNOWN	18.85 MVS	86.0
13	UNKNOWN	35.74 MVS	89.8
14	UNKNOWN	65.71 MVS	98.6
15	UNKNOWN	19.15 MVS	117.3
16	UNKNOWN	13.99 MVS	126.6
17	TOLUENE	20.95 PPB	141.3
18	UNKNOWN	17.51 MVS	165.8
19	UNKNOWN	10.29 MVS	186.4
20	UNKNOWN	9.078 MVS	195.6
21	UNKNOWN	21.56 MVS	248.8
22	ETHYLBENZENE	17.04 PPB	274.1
23	O-XYLENE	38.68 PPE	340.0
24	UNKNOWN	2.272 MVS	413.0

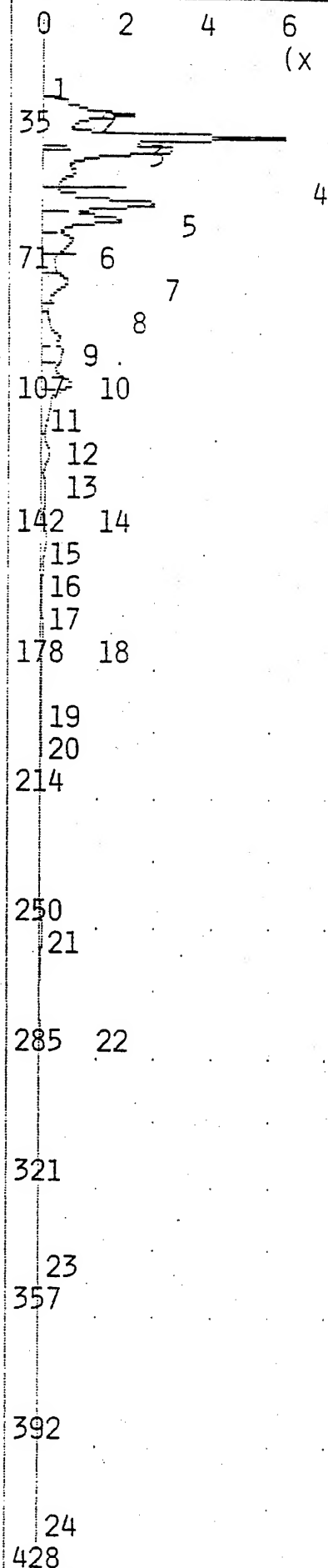
NOTES

JOE BYRD, JR.

DULUTH ANGB

025-012BH

0.5- 2.5 10G



ANALYSIS #15

10S+ GC FUNCTION ANALYSIS REPORT

0 4 8 12 16 20
(x 10 mV)

TIME PRINTED: MAY 17, 95 10:56

SAMPLE TIME: MAY 17,95 10:48

METHOD

SLOPE UP 0.500 MV/SEC

SLOPE DOWN 1.500 MV/SEC

MIN AREA	0.000	MVSEC
----------	-------	-------

MIN HEIGHT	0.000	MV
------------	-------	----

ANALYSIS DELAY	0.0	SEC
----------------	-----	-----

WINDOW PERCENT 10.0 %

DET FLOW 12 ML/MIN

B/F FLOW 12 ML/MIN

AUX FLOW 0 ML/MIN

OVEN TEMP 40 C

AMB TEMP 30 C

MAX GAIN	1000
----------	------

ANALYSIS TIME 500.0 SEC

PEAK REPORT

PK COMPOUND NAME	AREA/CONC	R.T.
------------------	-----------	------

NOTES

JOE BYRD, JR.

DULUTH ANGB

025-012BH

5.0- 7.0 10G

ANALYSIS #16 10S+ GC FUNCTION ANALYSIS REPORT

0 2 4 6 8 10
(x 10 MV)

TIME PRINTED: MAY 17,95 11:09

SAMPLE TIME: MAY 17,95 11:01

METHOD

SLOPE UP 0.500 MV/SEC

SLOPE DOWN 1.500 MV/SEC

MIN AREA 0.000 MVSEC

MIN HEIGHT 0.000 MV

ANALYSIS DELAY 0.0 SEC

WINDOW PERCENT 10.0 %

DET FLOW 12 ML/MIN

B/F FLOW 12 ML/MIN

AUX FLOW 0 ML/MIN

OVEN TEMP 40 C

AMB TEMP 30 C

MAX GAIN 1000

ANALYSIS TIME 500.0 SEC

PEAK REPORT

PK COMPOUND NAME AREA/CONC R.T.

35

71

107

142

178

214

250

285

321

357

392

428

NOTES

JOE BYRD, JR.

DULUTH ANGB

025-012BH RESHOT

5.0- 7.0 10G

20 MICROLITER INJECTION

ANALYSIS #17 10S+ GC FUNCTION ANALYSIS REPORT

0 4 8 12 16 20
(X 10 MV)

TIME PRINTED: MAY 17,95 11:20

SAMPLE TIME: MAY 17,95 11:12

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 30 C
MAX GAIN 1000
ANALYSIS TIME 500.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	1.160 MVS	20.6
2	UNKNOWN	17.70 MVS	22.6
3	UNKNOWN	421.9 MVS	26.6
4	UNKNOWN	347.6 MVS	32.7
5	UNKNOWN	360.0 MVS	36.4
6	UNKNOWN	341.5 MVS	38.6
7	UNKNOWN	60.44 MVS	45.9
8	UNKNOWN	170.8 MVS	49.6
9	UNKNOWN	108.6 MVS	54.2
10	UNKNOWN	136.4 MVS	60.8
11	UNKNOWN	158.6 MVS	71.3
12	BENZENE	48.28 PPB	83.8
13	UNKNOWN	167.5 MVS	86.6
14	UNKNOWN	71.74 MVS	98.4
15	UNKNOWN	57.25 MVS	117.4
16	TOLUENE	31.41 PPB	143.6
17	UNKNOWN	5.800 MVS	244.2
18	ETHYLBENZENE	4.454 PPB	272.2
19	O-XYLENE	13.64 PPB	341.3

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-012BH
10.0-12.0 10G

0 1 2 3 4 5
(x 100 MV)

TIME PRINTED: MAY 17,95 11:32

SAMPLE TIME: MAY 17,95 11:24

METHOD

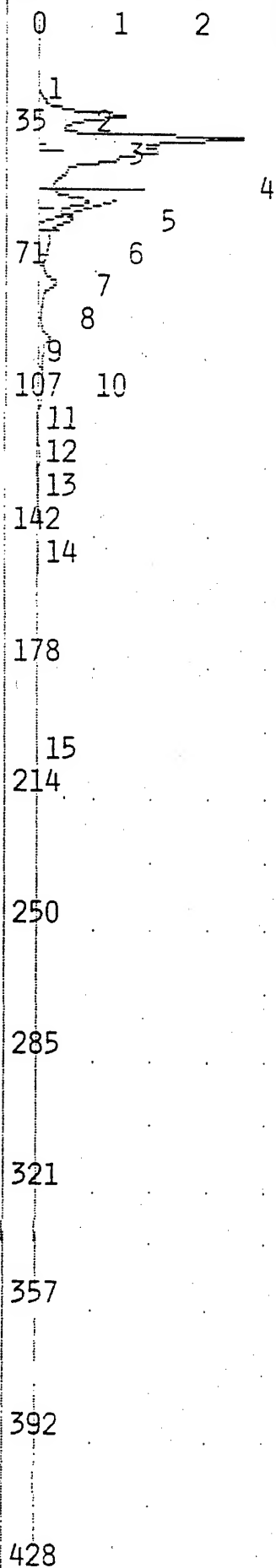
SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 30 C
MAX GAIN 1000
ANALYSIS TIME 500.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	5.800 MVS	20.8
2	UNKNOWN	19.48 MVS	22.5
3	UNKNOWN	405.5 MVS	26.8
4	UNKNOWN	684.6 MVS	32.9
5	UNKNOWN	754.6 MVS	36.4
6	UNKNOWN	15.49 MVS	38.8
7	UNKNOWN	263.0 MVS	50.1
8	UNKNOWN	175.4 MVS	54.8
9	UNKNOWN	109.4 MVS	60.5
10	UNKNOWN	141.9 MVS	72.0
11	BENZENE	40.98 PPB	87.3
12	UNKNOWN	77.65 MVS	99.2
13	UNKNOWN	63.48 MVS	118.2
14	TOLUENE	45.51 PPB	145.0
15	UNKNOWN	3.486 MVS	195.4

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-012BH
18.0-20.0 10G



ANALYSIS #19 10S+ GC FUNCTION ANALYSIS REPORT

0 1 2 3 4 5
(x 10 MV)

TIME PRINTED: MAY 17,95 13:29

SAMPLE TIME: MAY 17,95 13:21

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 29 C
MAX GAIN 1000

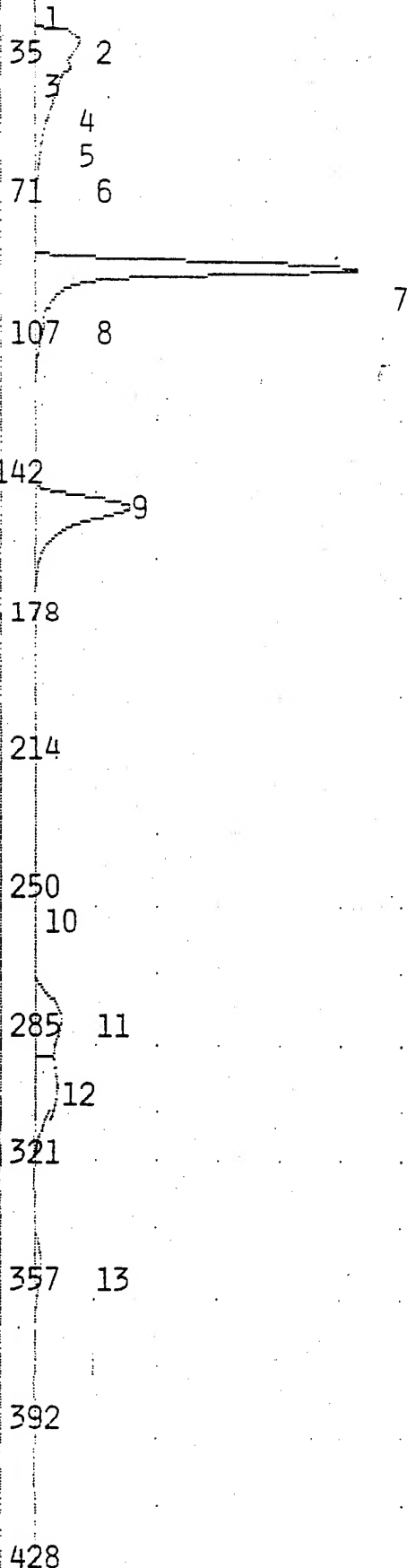
ANALYSIS TIME 500.0 SEC

PEAK REPORT

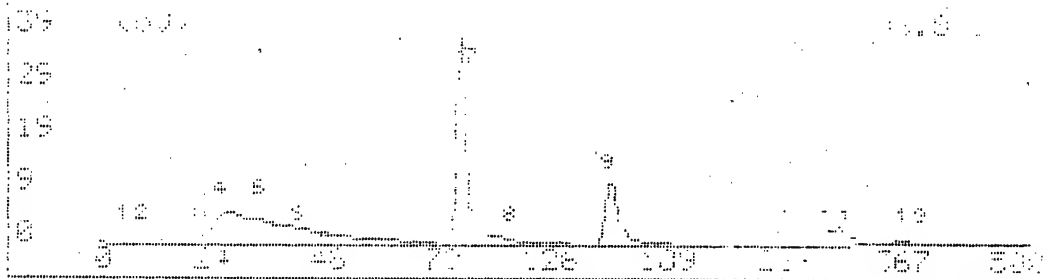
PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.889 MVS	5.2
2	UNKNOWN	2.797 MVS	9.2
3	UNKNOWN	0.411 MVS	20.2
4	UNKNOWN	126.7 MVS	25.2
5	UNKNOWN	1.455 MVS	32.2
6	UNKNOWN	0.765 MVS	38.3
7	BENZENE	76.67 PPB	83.8
8	UNKNOWN	0.453 MVS	98.4
9	TOLUENE	83.95 PPB	144.4
10	UNKNOWN	0.186 MVS	246.1
11	ETHYLBENZENE	79.82 PPB	276.2
12	M,P-XYLENE	151.3 PPB	293.8
13	O-XYLENE	78.02 PPB	347.0

NOTES

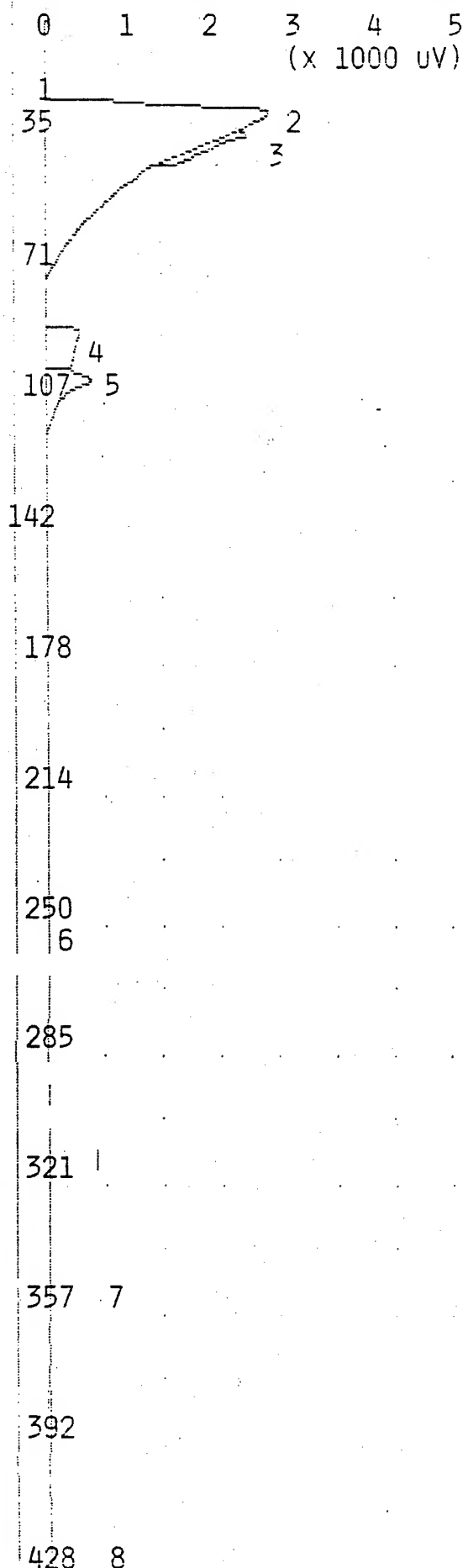
JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX



G.C. Ready		100% EL Fraction		3:21	
-- Analysis No 17		Run at - He		7.11.87	
Pk No	Name	Conc	Area	7.11.87	
1	Unknown	1.453	MUS	10.0	0.0
2	Unknown	2.785	MUS	10.0	0.0
3	Benzene	3.000	POB	10.0	0.0
4	Unknown	4.433	MUS	10.0	0.0
5	Toluene	5.000	POB	10.0	0.0
6	Unknown	6.198	MUS	10.0	0.0
7	ethyl acetate	6.000	POB	10.0	0.0
8	Methylalene	10.000	POB	10.0	0.0
9	Octanone	10.000	POB	10.0	0.0
Fraction 15 conc. 1.000 to 3.000				10.0	0.0



ANALYSIS #20 10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 17,95 13:44
SAMPLE TIME: MAY 17,95 13:36

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 29 C
MAX GAIN 1000

ANALYSIS TIME 500.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.033 MVS	20.0
2	UNKNOWN	74.26 MVS	25.4
3	UNKNOWN	1.632 MVS	32.0
4	BENZENE	2.989 PPB	86.5
5	UNKNOWN	4.932 MVS	98.1
6	ETHYLBENZENE	0.816 PPB	251.4
7	O-XYLENE	73.16 PPB	349.0
8	UNKNOWN	4.197 MVS	414.3

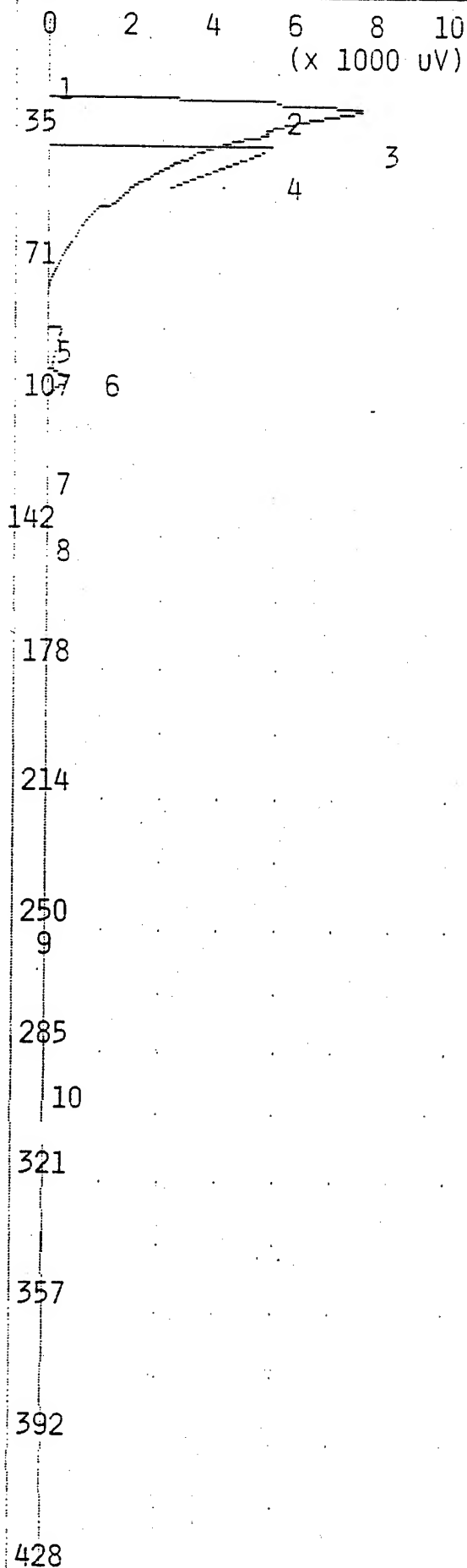
NOTES

JOE BYRD, JR.
DULUTH ANGB

~~025 013BH~~ *J*

~~0.5 2.5 100~~
AIR BLANK

ANALYSIS #21 10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 17, 95 13:56
SAMPLE TIME: MAY 17, 95 13:47

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 30 C
MAX GAIN 1000

ANALYSIS TIME 500.0 SEC

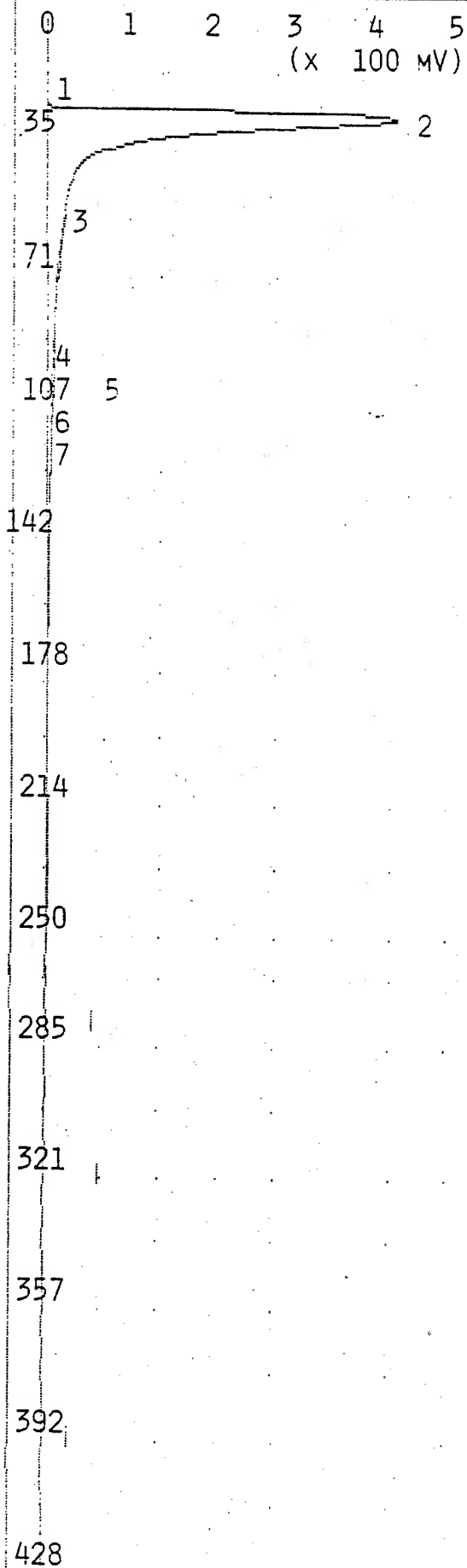
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.157 MVS	20.1
2	UNKNOWN	9.574 MVS	22.6
3	UNKNOWN	180.6 MVS	25.0
4	UNKNOWN	0.528 MVS	31.6
5	BENZENE	3.574 PPB	84.9
6	UNKNOWN	17.75 MVS	98.4
7	UNKNOWN	16.86 MVS	119.3
8	TOLUENE	2.556 PPB	142.9
9	ETHYLBENZENE	1.346 PPB	251.2
10	M,P-XYLENE	3.317 PPB	294.4

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-013BH
0.5- 2.5 10G

ANALYSIS #26 10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 17,95 15:18
SAMPLE TIME: MAY 17,95 15:09

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000
ANALYSIS TIME 500.0 SEC

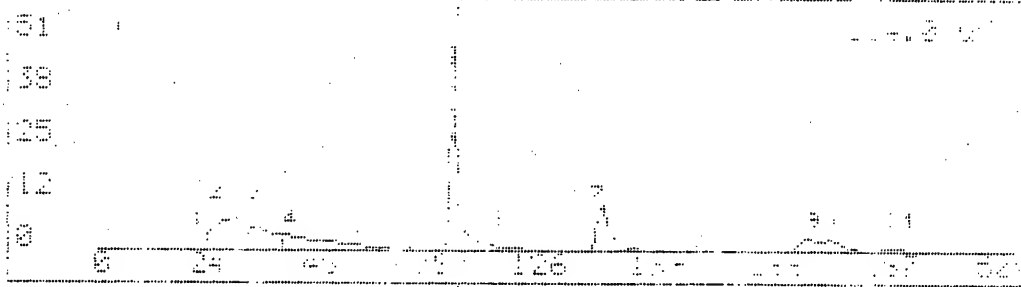
PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.025 MVS	20.5
2	UNKNOWN	4.491 VSEC	26.8
3	UNKNOWN	21.96 MVS	54.2
4	BENZENE	1.045 PPB	84.4
5	UNKNOWN	2.850 MVS	91.8
6	UNKNOWN	3.364 MVS	95.8
7	UNKNOWN	7.268 MVS	100.5

NOTES

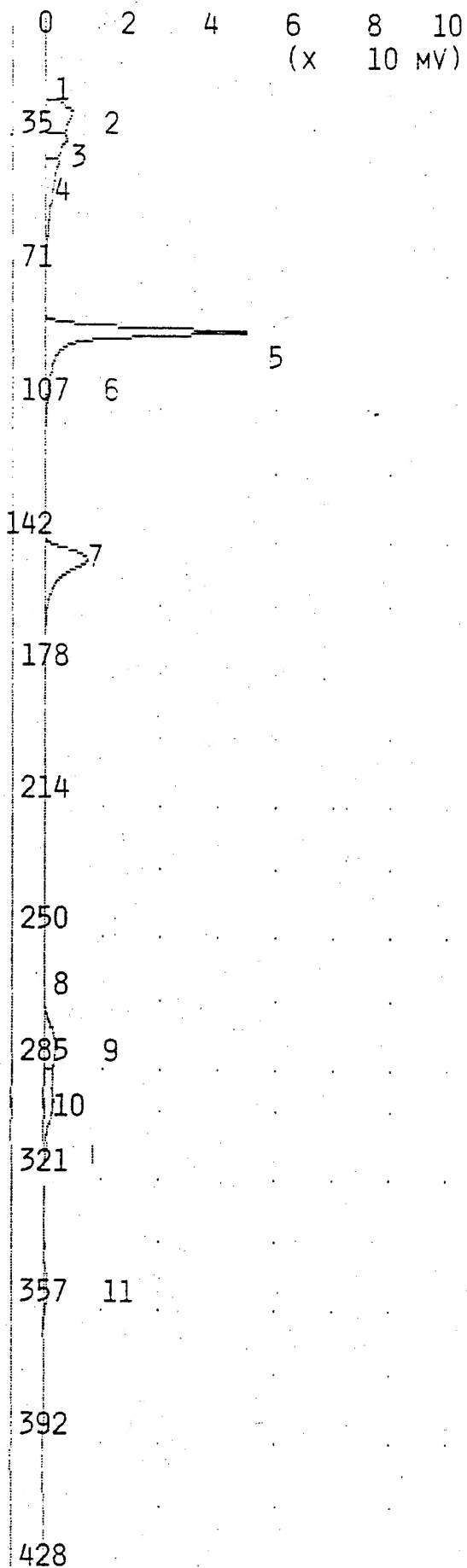
JOE BYRD, JR.
DULUTH ANGB
AIR BLANK

Q	FE	FUNCTION	TIME
1	10	10	10
2	10	10	10
3	10	10	10
4	10	10	10
5	10	10	10
6	10	10	10
7	10	10	10
8	10	10	10
9	10	10	10
10	10	10	10
11	10	10	10
12	10	10	10
13	10	10	10
14	10	10	10
15	10	10	10
16	10	10	10
17	10	10	10
18	10	10	10
19	10	10	10
20	10	10	10
21	10	10	10
22	10	10	10
23	10	10	10
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25	10	10	10
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27	10	10	10
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29	10	10	10
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31	10	10	10
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33	10	10	10
34	10	10	10
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37	10	10	10
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39	10	10	10
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47	10	10	10
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53	10	10	10
54	10	10	10
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89	10	10	10
90	10	10	10
91	10	10	10
92	10	10	10
93	10	10	10
94	10	10	10
95	10	10	10
96	10	10	10
97	10	10	10
98	10	10	10
99	10	10	10
100	10	10	10



ANALYSIS #25

10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 17,95 14:49

SAMPLE TIME: MAY 17,95 14:41

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 31 C
MAX GAIN 1000

ANALYSIS TIME 500.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.042 MVS	20.6
2	UNKNOWN	55.58 MVS	25.6
3	UNKNOWN	31.74 MVS	32.8
4	UNKNOWN	56.63 MVS	39.0
5	BENZENE	95.93 PPB	84.2
6	UNKNOWN	1.090 MVS	98.9
7	TOLUENE	91.85 PPB	145.2
8	UNKNOWN	0.577 MVS	253.0
9	ETHYLBENZENE	87.00 PPB	277.0
10	M,P-XYLENE	177.5 PPB	294.4
11	O-XYLENE	92.84 PPB	347.3

NOTES

JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX

0 2 4 6 8 10
(x 10 MV)

TIME PRINTED: MAY 17,95 14:37

SAMPLE TIME: MAY 17,95 14:29

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 30 C
MAX GAIN 1000
ANALYSIS TIME 500.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	1.594 MVS	20.5
2	UNKNOWN	10.75 MVS	22.6
3	UNKNOWN	131.2 MVS	26.3
4	UNKNOWN	150.6 MVS	32.4
5	UNKNOWN	68.97 MVS	35.6
6	UNKNOWN	83.15 MVS	38.6
7	UNKNOWN	50.90 MVS	49.3
8	UNKNOWN	46.04 MVS	53.8
9	UNKNOWN	27.65 MVS	59.4
10	UNKNOWN	37.62 MVS	71.2
11	BENZENE	9.781 PPB	86.5
12	UNKNOWN	23.48 MVS	90.4
13	UNKNOWN	45.55 MVS	99.3
14	UNKNOWN	11.10 MVS	118.0
15	UNKNOWN	7.675 MVS	127.6
16	TOLUENE	16.38 PPB	143.0
17	UNKNOWN	3.007 MVS	166.4
18	ETHYLBENZENE	2.832 PPB	249.6
19	O-XYLENE	3.779 PPB	348.6

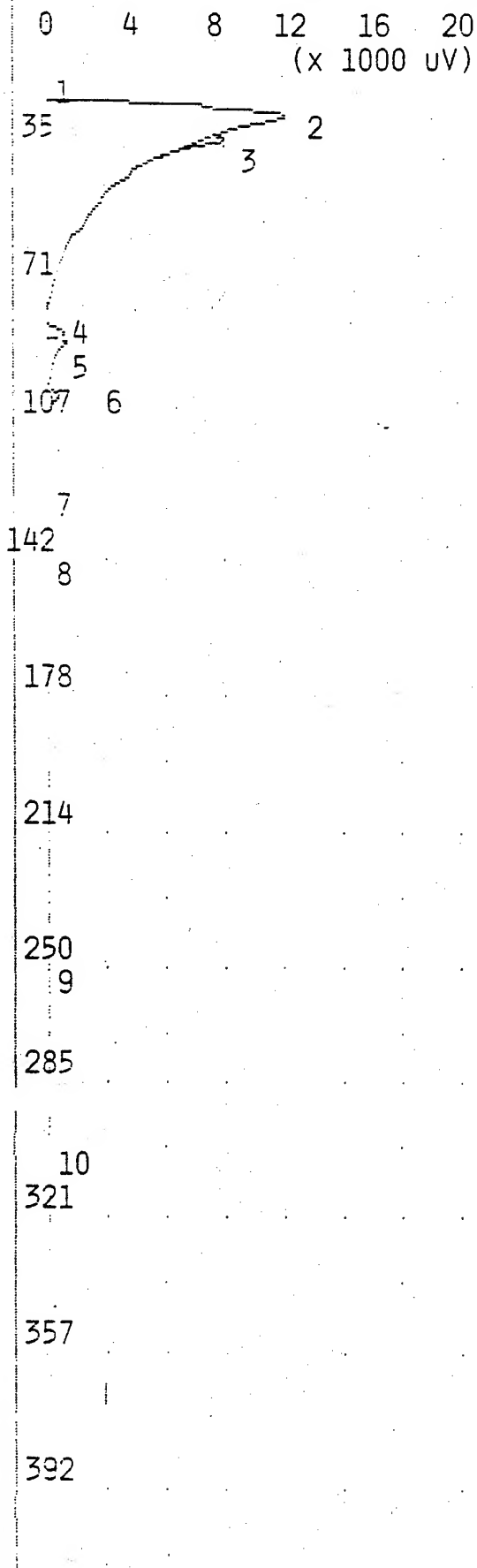
NOTES

JOE BYRD, JR.
DULUTH ANGB
025-013BH

18.0-20.0 10G

35
71
107
142
15
16
178
214
250
285
321
357
392
428

ANALYSIS #23 10S+ GC FUNCTION ANALYSIS REPORT



TIME PRINTED: MAY 17,95 14:19
SAMPLE TIME: MAY 17,95 14:11

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 30 C
MAX GAIN 1000
ANALYSIS TIME 500.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.243 MVS	20.6
2	UNKNOWN	242.3 MVS	25.2
3	UNKNOWN	2.060 MVS	31.8
4	UNKNOWN	2.665 MVS	82.1
5	BENZENE	3.515 PPB	84.1
6	UNKNOWN	4.841 MVS	98.2
7	UNKNOWN	0.440 MVS	120.5
8	TOLUENE	2.497 PPB	143.8
9	ETHYLBENZENE	3.962 PPB	251.2
10	M,P-XYLENE	2.483 PPB	299.2

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-013BH
10.0-12.0 10G

ANALYSIS #22 10S+ GC FUNCTION ANALYSIS REPORT

0 2 4 6 8 10
(x 1000 UV)

TIME PRINTED: MAY 17,95 14:07

SAMPLE TIME: MAY 17,95 13:59

METHOD

SLOPE UP 0.500 MV/SEC
SLOPE DOWN 1.500 MV/SEC
MIN AREA 0.000 MVSEC
MIN HEIGHT 0.000 MV
ANALYSIS DELAY 0.0 SEC
WINDOW PERCENT 10.0 %
DET FLOW 12 ML/MIN
B/F FLOW 12 ML/MIN
AUX FLOW 0 ML/MIN
OVEN TEMP 40 C
AMB TEMP 30 C
MAX GAIN 1000

ANALYSIS TIME 500.0 SEC

PEAK REPORT

PK	COMPOUND NAME	AREA/CONC	R.T.
1	UNKNOWN	0.106 MVS	19.8
2	UNKNOWN	13.53 MVS	22.4
3	UNKNOWN	169.6 MVS	25.0
4	UNKNOWN	0.441 MVS	31.6
5	BENZENE	2.935 PPB	85.4
6	UNKNOWN	4.997 MVS	98.6
7	UNKNOWN	0.426 MVS	117.2
8	TOLUENE	2.283 PPB	143.7
9	UNKNOWN	0.406 MVS	165.6
10	UNKNOWN	15.39 MVS	249.6
11	ETHYLBENZENE	19.64 PPB	274.9
12	O-XYLENE	105.9 PPB	342.0
13	UNKNOWN	6.306 MVS	414.3

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-013BH

5.0- 7.0 10G

APPENDIX C

MONITOR WELL CONSTRUCTION RECORDS

INTRODUCTION

The monitor wells for IRP Sites No. 25 and No. 26 were constructed as specified in the Site Investigation Work Plan. The monitor well construction diagram displays the water level data and well construction information for the well. Monitor well construction information includes an outline of the monitor well and contains the depth of the borehole, the screened interval, and the sand packed and bentonite interval.

Also included in this appendix are copies of the well record for the Minnesota Department of Health.

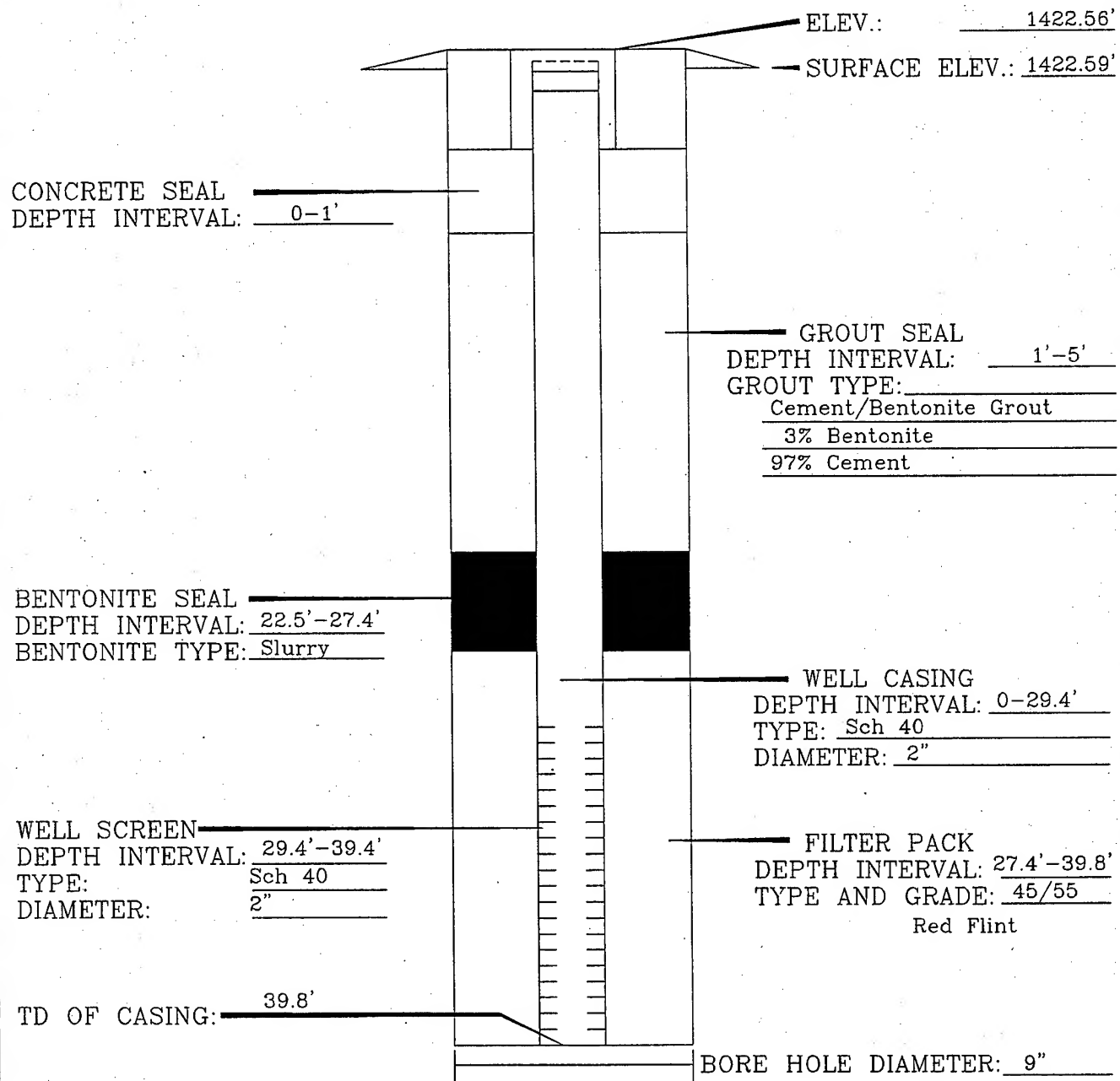
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TOP OF PROTECTIVE ENCASEMENT: _____

MANHOLE DIAMETER: _____

KEY NO.: _____

BOLT SIZE: _____



025-001MW
MONITOR WELL CONSTRUCTION DIAGRAM
Duluth Air National Guard
Duluth, Minnesota

DULUTH\FISHWELL

OPTTECH
OPERATIONAL TECHNOLOGIES
CORPORATION

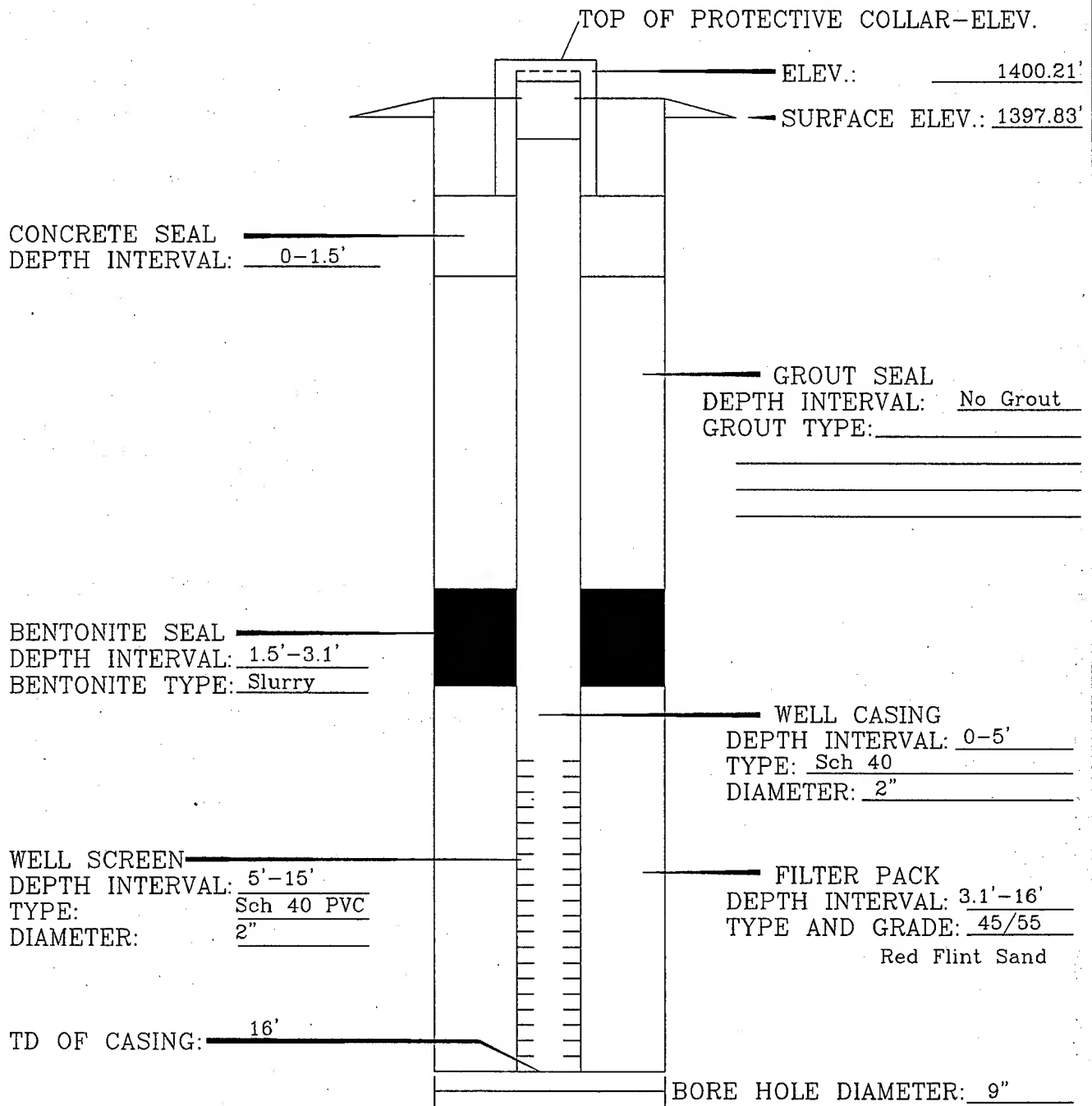
AUGUST 1995

TOP OF PROTECTIVE ENCASEMENT: _____

MANHOLE DIAMETER: _____

KEY NO.: _____

BOLT SIZE: _____



025-002MW
MONITOR WELL CONSTRUCTION DIAGRAM
Duluth Air National Guard
Duluth, Minnesota

DULUTH\WELLDIAG

OPTECH
OPERATIONAL TECHNOLOGIES
CORPORATION

AUGUST 1995

TOP OF PROTECTIVE ENCASEMENT: _____

MANHOLE DIAMETER: _____

KEY NO.: _____

BOLT SIZE: _____

TOP OF PROTECTIVE COLLAR-ELEV. _____

ELEV.: 1405.32'

SURFACE ELEV.: 1402.71'

CONCRETE SEAL
DEPTH INTERVAL: 0-4'

GROUT SEAL
DEPTH INTERVAL: No Grout
GROUT TYPE: _____

BENTONITE SEAL
DEPTH INTERVAL: 4.0'-7.6'
BENTONITE TYPE: Slurry

WELL CASING
DEPTH INTERVAL: 0-19.7'
TYPE: Sch 40
DIAMETER: 2"

WELL SCREEN
DEPTH INTERVAL: 9.7'-19.7'
TYPE: Sch 40 PVC
DIAMETER: 2"

FILTER PACK
DEPTH INTERVAL: 7.6'-21'
TYPE AND GRADE: 45/55
Red Flint Sand

TD OF CASING: 21'

BORE HOLE DIAMETER: 9"

025-003MW

MONITOR WELL CONSTRUCTION DIAGRAM

Duluth Air National Guard
Duluth, Minnesota

DULUTH\WELLDIAG

OPTTECH
OPERATIONAL TECHNOLOGIES
CORPORATION

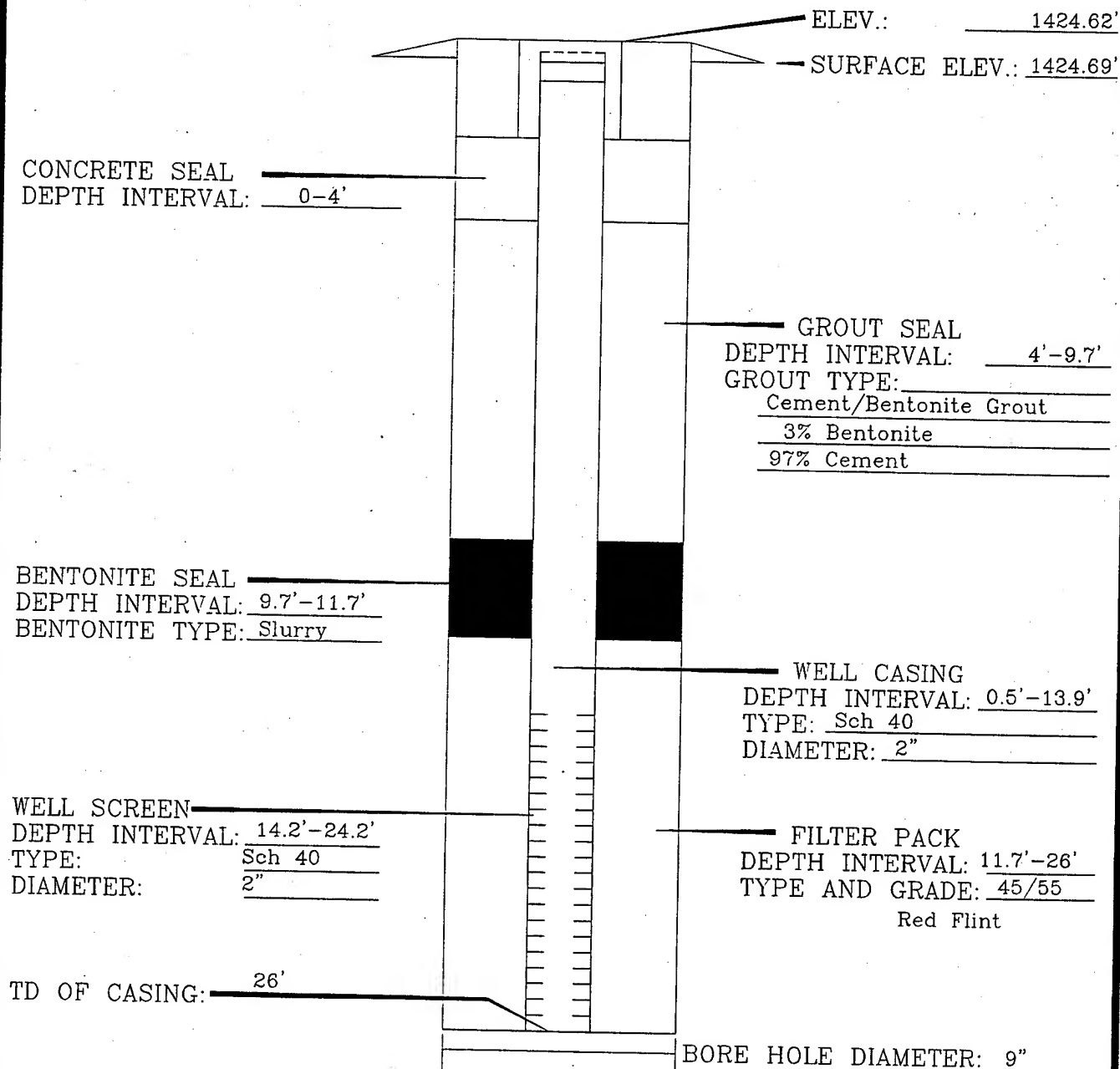
AUGUST 1995

TOP OF PROTECTIVE ENCASEMENT: _____

MANHOLE DIAMETER: _____

KEY NO.: _____

BOLT SIZE: _____



026-001MW
MONITOR WELL CONSTRUCTION DIAGRAM

Duluth Air National Guard
Duluth, Minnesota

DULUTH\FLSHWELL

OPTTECH
OPERATIONAL TECHNOLOGIES
CORPORATION

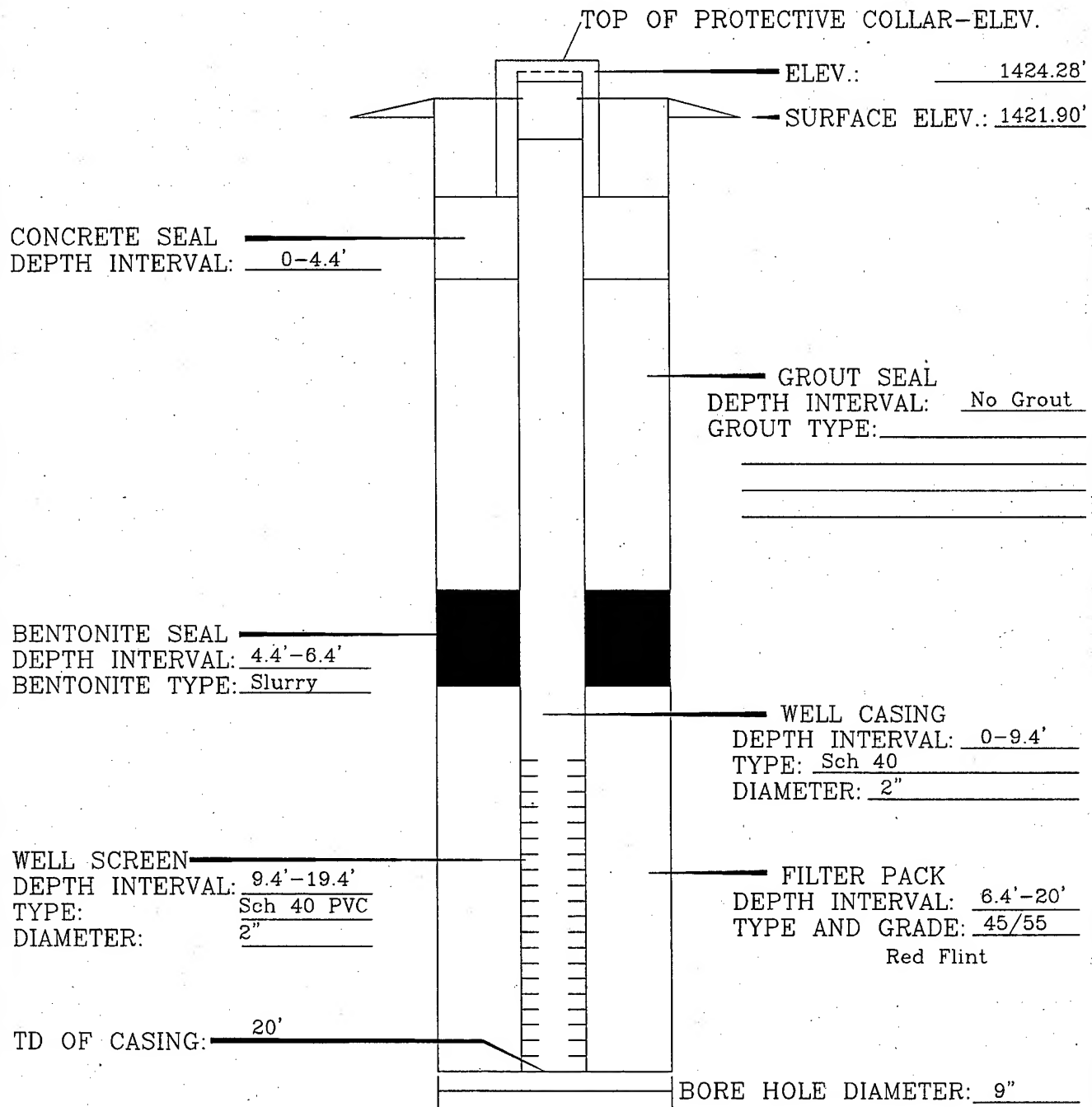
AUGUST 1995

TOP OF PROTECTIVE ENCASEMENT: _____

MANHOLE DIAMETER: _____

KEY NO.: _____

BOLT SIZE: _____



026-002MW
MONITOR WELL CONSTRUCTION DIAGRAM

Duluth Air National Guard
Duluth, Minnesota

DULUTH\WELLDIAG

OPTTECH
OPERATIONAL TECHNOLOGIES
CORPORATION

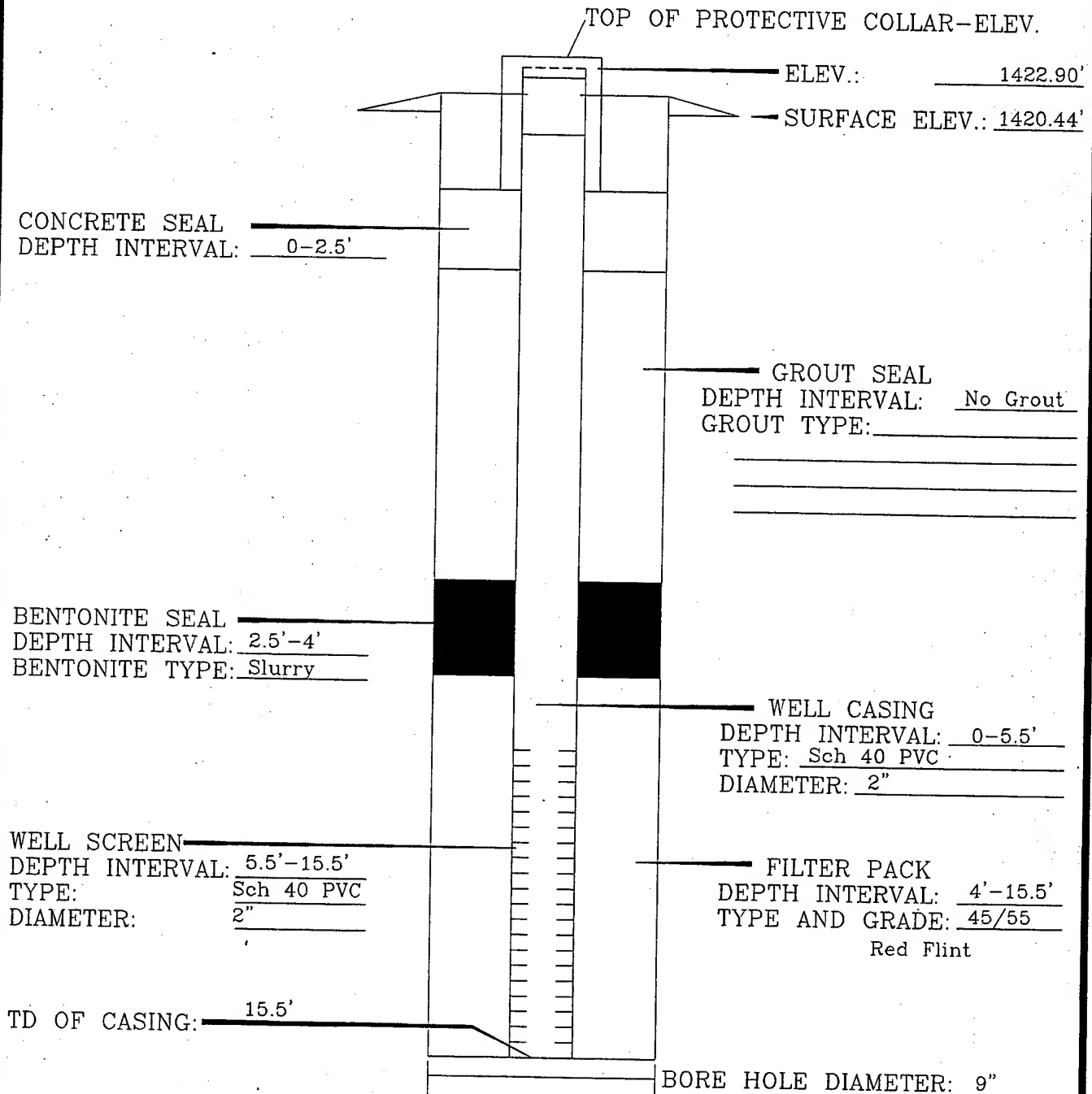
AUGUST 1995

TOP OF PROTECTIVE ENCASEMENT: _____

MANHOLE DIAMETER: _____

KEY NO.: _____

BOLT SIZE: _____



026-003MW
MONITOR WELL CONSTRUCTION DIAGRAM

Duluth Air National Guard
Duluth, Minnesota

DULUTH\WELLDIAG

OPTECH
OPERATIONAL TECHNOLOGIES
CORPORATION

AUGUST 1995

WELL LOCATION
County Name
ST. LOUIS

MINNESOTA DEPARTMENT OF HEALTH
WELL RECORD
Minnesota Statutes Chapter 103I

MINNESOTA UNIQUE WELL NO.

564549

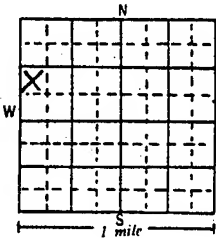
Township Name Duluth Township No. 50N Range No. 14W Section No. 6 Fraction 1/4 SW 1/4

WELL DEPTH (completed) 39.4 ft. Date Work Completed 5-10-95

Numerical Street Address and City of Well Location
4680 Uper or Fire Number

DRILLING METHOD
☐ Cable Tool ☐ Driven ☐ Dug
☒ Auger ☐ Rotary ☐ Jetted

Show exact location of well in section grid with "X".



Sketch map of well location. Showing property lines, roads and buildings.

DRILLING FLUID
None.

USE
☐ Domestic ☒ Monitoring ☐ Heating/Cooling
☐ Irrigation ☐ Public ☐ Industry/Commercial
☐ Test Well ☐ Dewatering ☐ Remedial

CASING Drive Shoe? ☐ Yes ☒ No
☐ Steel ☒ Threaded ☐ Welded
☒ Plastic ☐ HOLE DIAM.

CASING DIAMETER 2 in. to 29.4 ft. WEIGHT 8.0 lbs./ft. to 39.8 lbs./ft.

SCREEN Make Johnson OPEN HOLE from 39.4 ft. to 29.4 ft.
Type Sch. 40 PVC Diam. 2"
Slot/Gauze #10 Length 10'
Set between 39.4 ft. and 29.4 ft. FITTINGS W/FM Flush

GEOLOGICAL MATERIALS COLOR HARDNESS OF MATERIAL FROM TO

Black Top.				
5.44 sand w/ sand			0	8
Gravel & Cobble Fill	BROWN	med Dense.	8	11.0
Sandy silt w/ wood		VERY		
TO 17' Gravel & Cobble	BROWN	Dense.	11.0	23.5
WATER BEARING		VERY		
SAND & GRAVEL	BROWN	DENSE.	23.5	39.8

STATIC WATER LEVEL 32.4 ft. ☒ below ☐ above land surface Date measured 5-10-95

PUMPING LEVEL (below land surface) _____ ft. after _____ hrs. pumping _____ g.p.m.

WELL HEAD COMPLETION
☐ Pitless adapter manufacturer _____ Model _____
☒ Casing Protection W/ 1/2" CONC. PAD ☐ 12 in. above grade

GROUTING INFORMATION
Well grouted? ☒ Yes ☐ No
Grout Material Nea cement ☐ Bentonite
Bentonite from 27.0 to 22.0 ft. ☐ yds. ☐ bags
Nea cement from 22.0 to 12 ft. ☐ yds. ☐ bags
CONCRETE from 12 to _____ ft. ☐ yds. ☐ bags

NEAREST KNOWN SOURCE OF CONTAMINATION _____ feet _____ direction _____ type
Well disinfected upon completion? ☐ Yes ☐ No

PUMP
☒ Not installed Date installed _____
Manufacturer's name _____
Model number _____ HP _____ Volts _____
Length of drop pipe _____ ft. Capacity _____ g.p.m.
Pressure Tank Capacity _____
Type: ☐ Submersible ☐ L.S. Turbine ☐ Reciprocating ☐ Jet ☐ _____

ABANDONED WELLS
Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

WELL CONTRACTOR CERTIFICATION
This well was drilled under my supervision and in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.

American Engineering Testing Model 3
Licensee Business Name _____ Lic. or Reg. No. _____

J. Kim 6-12-95
Authorized Representative Signature Date

JAMIE TOURNA 5-10-95
Name of Driller Date

REMARKS, ELEVATION, SOURCE OF DATA, etc.
American Engineering. Job # 95-7091
El. BY RREM INC.
TOP OF RISER. EL. 1422.56
GROUND SURFACE EL. 1422.56

MINN. DEPT. OF HEALTH COPY 564549

WELL LOCATION					MINNESOTA DEPARTMENT OF HEALTH WELL RECORD <i>Minnesota Statutes Chapter 103I</i>		MINNESOTA UNIQUE WELL NO. <div style="border: 1px solid black; padding: 5px; display: inline-block;">564550</div>																					
County Name <i>ST. LOUIS.</i>																												
Township Name <i>Duluth</i>	Township No. <i>50N</i>	Range No. <i>14W</i>	Section No. <i>6</i>	Fraction <i>NW SW NW</i>	WELL DEPTH (completed) <i>15.0</i> ft.	Date Work Completed <i>5-11-95</i>																						
Numerical Street Address and City of Well Location <i>4680 Uper Street</i>					DRILLING METHOD <input checked="" type="checkbox"/> Cable Tool <input type="checkbox"/> Driven <input type="checkbox"/> Dug <input checked="" type="checkbox"/> Auger <input type="checkbox"/> Rotary <input type="checkbox"/> Jetted <input type="checkbox"/> _____																							
Show exact location of well in section grid with "X". <i>Bldg 243</i>					DRILLING FLUID <i>NONE.</i>																							
Sketch map of well location. Showing property lines, roads and buildings. 					USE <input type="checkbox"/> Domestic <input checked="" type="checkbox"/> Monitoring <input type="checkbox"/> Heating/Cooling <input type="checkbox"/> Irrigation <input type="checkbox"/> Public <input type="checkbox"/> Industry/Commercial <input type="checkbox"/> Test Well <input type="checkbox"/> Dewatering <input type="checkbox"/> Remedial																							
PROPERTY OWNER'S NAME <i>MN. AIR NATIONAL GUARD</i> Mailing address if different than property address indicated above. <i>4680 Uper Street Duluth MN. 55811</i>					CASING <input type="checkbox"/> Steel <input checked="" type="checkbox"/> Plastic Drive Shoe? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		HOLE DIAM. <input type="checkbox"/> Welded																					
					Casing Diameter <i>2"</i> in. to <i>5.0</i> ft.		WEIGHT <i>8.0</i> in. to <i>17.0</i> ft.																					
GEOLOGICAL MATERIALS					SCREEN Make <i>Johnson</i> Type <i>Sch 40 PVC</i> Slot/Gauge <i>.010</i> Set between <i>15.0</i> ft. and <i>5.0</i> ft.		OPEN HOLE from _____ ft. to _____ ft. Diam. <i>2"</i> Length <i>10.0</i> Set between <i>15.0</i> ft. and <i>5.0</i> ft. FITTINGS: <i>M/FM. Flush</i>																					
					STATIC WATER LEVEL <i>6.0</i> ft. <input checked="" type="checkbox"/> below <input type="checkbox"/> above land surface Date measured <i>5-11-95</i>																							
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:30%;">COLOR</th> <th style="width:20%;">HARDNESS OF MATERIAL</th> <th style="width:10%;">FROM</th> <th style="width:10%;">TO</th> </tr> </thead> <tbody> <tr> <td><i>Sod</i></td> <td><i>Green</i></td> <td><i>0</i></td> <td><i>.3</i></td> </tr> <tr> <td><i>Silty sand w/ some gravel + boulders</i></td> <td><i>Brown</i></td> <td><i>.3</i></td> <td><i>7.0</i></td> </tr> <tr> <td><i>ORGANIC. sandy silt</i></td> <td><i>DARK BROWN</i></td> <td><i>7.0</i></td> <td><i>7.5</i></td> </tr> <tr> <td><i>Sandy silty sand w/ some gravel cobbles</i></td> <td><i>BROWN</i></td> <td><i>7.5</i></td> <td><i>17.0</i></td> </tr> </tbody> </table>					COLOR	HARDNESS OF MATERIAL	FROM	TO	<i>Sod</i>	<i>Green</i>	<i>0</i>	<i>.3</i>	<i>Silty sand w/ some gravel + boulders</i>	<i>Brown</i>	<i>.3</i>	<i>7.0</i>	<i>ORGANIC. sandy silt</i>	<i>DARK BROWN</i>	<i>7.0</i>	<i>7.5</i>	<i>Sandy silty sand w/ some gravel cobbles</i>	<i>BROWN</i>	<i>7.5</i>	<i>17.0</i>	PUMPING LEVEL (below land surface) _____ ft. after _____ hrs. pumping _____ g.p.m.			
					COLOR	HARDNESS OF MATERIAL	FROM	TO																				
<i>Sod</i>	<i>Green</i>	<i>0</i>	<i>.3</i>																									
<i>Silty sand w/ some gravel + boulders</i>	<i>Brown</i>	<i>.3</i>	<i>7.0</i>																									
<i>ORGANIC. sandy silt</i>	<i>DARK BROWN</i>	<i>7.0</i>	<i>7.5</i>																									
<i>Sandy silty sand w/ some gravel cobbles</i>	<i>BROWN</i>	<i>7.5</i>	<i>17.0</i>																									
					WELL HEAD COMPLETION <input type="checkbox"/> Pitless adapter manufacturer _____ Model _____ <input checked="" type="checkbox"/> Casing Protection <i>6" x 7' sch 40 steel 12 in. above grade</i> <i>3" x 4" x 7.5 steel guard posts</i>																							
					GROUTING INFORMATION Well grouted? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Grout Material <input checked="" type="checkbox"/> Neat cement <input type="checkbox"/> Bentonite <i>Bentonite</i> from <i>3 1/2</i> to <i>2</i> ft. _____ yds. _____ bags <i>concrete</i> from <i>2</i> to <i>0</i> ft. _____ yds. _____ bags from _____ to _____ ft. _____ yds. _____ bags																							
					NEAREST KNOWN SOURCE OF CONTAMINATION _____ feet _____ direction _____ type Well disinfected upon completion? <input type="checkbox"/> Yes <input type="checkbox"/> No																							
					PUMP <input checked="" type="checkbox"/> Not installed Date installed _____ Manufacturer's name _____ Model number _____ HP _____ Volts _____ Length of drop pipe _____ ft. Capacity _____ g.p.m. Pressure Tank Capacity _____ Type: <input type="checkbox"/> Submersible <input type="checkbox"/> L.S. Turbine <input type="checkbox"/> Reciprocating <input type="checkbox"/> Jet <input type="checkbox"/> _____																							
					ABANDONED WELLS Does property have any not in use and not sealed well(s)? <input type="checkbox"/> Yes <input type="checkbox"/> No																							
					WELL CONTRACTOR CERTIFICATION This well was drilled under my supervision and in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge. <i>American Engineering Testing MOD 3</i> Licensee Business Name _____ Lic. or Reg. No. _____ <i>J. S. [Signature]</i> <i>5-12-95</i> Authorized Representative Signature _____ Date _____ <i>JAMIE TOURIA</i> <i>5-11-95</i> Name of Driller _____ Date _____																							
REMARKS, ELEVATION, SOURCE OF DATA, etc. <i>Amer. can Engineering. Job # 95-7091</i> <i>El. By RREM. INC.</i> <i>Top of Riser El. 1400.21</i> <i>Ground surface El. 1397.83</i>					MINN. DEPT. OF HEALTH COPY <i>564550</i>																							

WELL LOCATION
County Name
ST. LOUIS

MINNESOTA DEPARTMENT OF HEALTH
WELL RECORD
Minnesota Statutes Chapter 103I

MINNESOTA UNIQUE WELL NO.

564551

Township Name DULUTH Township No. 50N Range No. 14W Section No. 6 Fraction N(1/2) S(1/2) N(1/2)

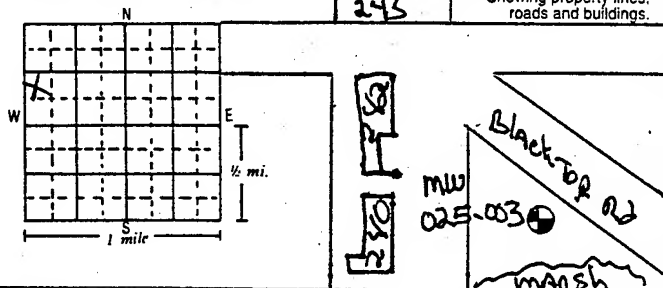
WELL DEPTH (completed) 17.2 ft. Date Work Completed 5-11-95

Numerical Street Address and City of Well Location
4680 UPER STREET

DRILLING METHOD
☐ Cable Tool ☐ Driven ☐ Dug
☒ Auger ☐ Rotary ☐ Jetted

Show exact location of well in section grid with "X".
085
243

DRILLING FLUID
NONE.



USE
☐ Domestic ☒ Monitoring ☐ Heating/Cooling
☐ Irrigation ☐ Public ☐ Industry/Commercial
☐ Test Well ☐ Dewatering ☐ Remedial

CASING Drive Shoe? ☐ Yes ☒ No
☐ Steel ☒ Threaded ☐ Welded
☒ Plastic ☐ HOLE DIAM.

CASING DIAMETER 2 in. to 7.2 ft. WEIGHT 8.0 in. to 22.0 ft.
2 in. to 7.2 ft. 8.0 in. to 22.0 ft.
2 in. to 7.2 ft. 8.0 in. to 22.0 ft.

PROPERTY OWNER'S NAME
MN. NAT. GUARD.

SCREEN Make Johnson OPEN HOLE from 17.2 ft. to 7.2 ft.
Type sch. 40. PVC. Diam. 2 in.
Slot/Gauze .010 Length 19.0
Set between 17.2 ft. and 7.2 ft. FITTINGS: M/FUL. FLUSH.

Mailing address if different than property address indicated above.
4680 UPER STREET
DULUTH MN. 55811

GEOLOGICAL MATERIALS COLOR HARDNESS OF MATERIAL FROM TO

STATIC WATER LEVEL 12.7 ft. below ☐ above land surface Date measured 5-11-95

sol. & top sol. 0 .3

PUMPING LEVEL (below land surface) 12.7 ft. after 0 hrs. pumping 0 g.p.m.

5. ft. sand & some BROWN DENSE. .3 13.0

WELL HEAD COMPLETION
☐ Pitless adapter manufacturer Model
☒ Casing Protection 6' x 7' sch. 40 steel ☐ 12 in. above grade

PEAT BROWN med 13.0 19.0

GROUTING INFORMATION
Well grouted? ☒ Yes ☐ No
Grout Material ☒ Nea: cement ☐ Bentonite

ORGANIC S.H BROWN Loose 19.0 22.0

Bentonite from 7.6 to 4.0 ft. ☐ yds. ☐ bags
CONCRETE from 4.0 to 0 ft. ☐ yds. ☐ bags

W SAND & GRAVEL BROWN Loose 19.0 22.0

NEAREST KNOWN SOURCE OF CONTAMINATION
_____ feet _____ direction _____ type

Well disinfected upon completion? ☐ Yes ☐ No

PUMP
☒ Not installed Date installed _____

Use a second sheet, if needed

Manufacturer's name _____
Model number _____ HP _____ Volts _____
Length of drop pipe _____ ft. Capacity _____ g.p.m.
Pressure Tank Capacity _____
Type: ☐ Submersible ☐ L.S. Turbine ☐ Reciprocating ☐ Jet ☐

ABANDONED WELLS
Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

WELL CONTRACTOR CERTIFICATION
This well was drilled under my supervision and in accordance with Minnesota Rules, Chapter 4725.
The information contained in this report is true to the best of my knowledge.

REMARKS, ELEVATION, SOURCE OF DATA, etc.

AMERICAN Engineering Testing MO063
Licensee Business Name Lic. or Reg. No.

AMERICAN Engineering Job #957091

EL. BY RREM. INC.

Top of Riser. El. 1405.2

JAMIE TOURIA 5-11-95
Name of Driller Date

Ground surface El. 1402.71

HE-01205-04 (Rev. 5/92)

MINN. DEPT. OF HEALTH COPY 564551

WELL LOCATION

County Name

ST. LOUIS

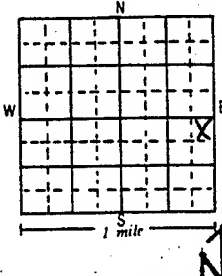
MINNESOTA DEPARTMENT OF HEALTH

WELL RECORD

Minnesota Statutes Chapter 103I

MINNESOTA UNIQUE WELL NO.

564552

Township Name Duluth	Township No. 504	Range No. 15W	Section No. 1	Fraction NE 1/4 NE 1/4 E	WELL DEPTH (completed) 24.2 ft.	Date Work Completed 5-5-95
Numerical Street Address and City of Well Location MIL. A.R. NATIONAL Guard Base (Duluth)					DRILLING METHOD <input type="checkbox"/> Cable Tool <input type="checkbox"/> Driven <input type="checkbox"/> Dug <input checked="" type="checkbox"/> Auger <input type="checkbox"/> Rotary <input type="checkbox"/> Jetted	
Show exact location of well in section grid with "X" 					DRILLING FLUID None	
PROPERTY OWNER'S NAME MIL. A.R. NATIONAL Guard. 4680 Viper Street Duluth MN. 55811					USE <input type="checkbox"/> Domestic <input checked="" type="checkbox"/> Monitoring <input type="checkbox"/> Heating/Cooling <input type="checkbox"/> Irrigation <input type="checkbox"/> Public <input type="checkbox"/> Industry/Commercial <input type="checkbox"/> Test Well <input type="checkbox"/> Dewatering <input type="checkbox"/> Remedial	
Mailing address if different than property address indicated above.					CASING Drive Shoe? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Steel <input checked="" type="checkbox"/> Threaded <input type="checkbox"/> Welded <input checked="" type="checkbox"/> Plastic <input type="checkbox"/>	
GEOLOGICAL MATERIALS					HOLE DIAM. 8.0 in. to 26.0	
COLOR					CASING DIAMETER WEIGHT 2.0 in. to 14.2 ft. lbs./ft. 8.0 in. to 26.0	
HARDNESS OF MATERIAL					SCREEN Johnson Make Johnson Type Sch 40 Pipe Slot/Gauge .010 Length 10' Set between 24.2 ft. and 14.2 ft. FITTINGS: 1 1/2" F.W. Flange	
FROM TO					STATIC WATER LEVEL 17.2 ft. below <input checked="" type="checkbox"/> above land surface Date measured 5-5-95	
PUMPING LEVEL (below land surface) ft. after hrs. pumping g.p.m.					WELL HEAD COMPLETION <input type="checkbox"/> Pitless adapter manufacturer Model <input checked="" type="checkbox"/> Casing Protection 4x4 CONCRETE Pipe 2 in. above grade w/ AT-Guardc. Manhole.	
GROUTING INFORMATION Well grouted? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Grout Material <input checked="" type="checkbox"/> Neat cement <input checked="" type="checkbox"/> Bentonite Bentonite from 11.7 to 9.7 ft. yds. bags Neat cement from 9.7 to 4.0 ft. yds. bags Concrete from 4.0 to 0 ft. yds. bags					NEAREST KNOWN SOURCE OF CONTAMINATION feet direction type Well disinfected upon completion? <input type="checkbox"/> Yes <input type="checkbox"/> No	
PUMP <input checked="" type="checkbox"/> Not installed Date installed Manufacturer's name Model number HP Volts Length of drop pipe ft. Capacity g.p.m. Pressure Tank Capacity Type: <input type="checkbox"/> Submersible <input type="checkbox"/> L.S. Turbine <input type="checkbox"/> Reciprocating <input type="checkbox"/> Jet <input type="checkbox"/>					ABANDONED WELLS Does property have any not in use and not sealed well(s)? <input type="checkbox"/> Yes <input type="checkbox"/> No	
WELL CONTRACTOR CERTIFICATION This well was drilled under my supervision and in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.					AMERICAN Engineering Testing Mobile 3 Licensee Business Name Lic. or Reg. No. Authorized Representative Signature Date JAMIE TUORA 5-5-95 Name of Driller Date	
REMARKS, ELEVATION, SOURCE OF DATA, etc. AMERICAN Engineering Job # 95-1091 El. By RREM INC. Top of Riser. El. 1424.62. Ground surface. El. 1424.69					MINN. DEPT. OF HEALTH COPY 564552	

564553

WELL LOCATION

County Name

ST. Louis

MINNESOTA DEPARTMENT OF HEALTH

WELL RECORD

Minnesota Statutes Chapter 103I

MINNESOTA UNIQUE WELL NO.

564554

Township Name
DuluthTownship No.
50 NRange No.
15 WSection No.
1Fraction
SE 1/4 SE NE

WELL DEPTH (completed)

15.5

ft.

Date Work Completed

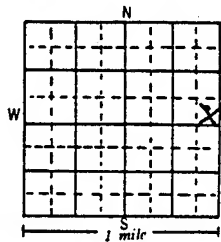
5-6-95

Numerical Street Address and City of Well Location

MN. A.R. Guard Base (Duluth)

or Fire Number

Show exact location of well in section grid with "X".



Sketch map of well location. Showing property lines, roads and buildings.

Ground
House
A.A. 15
Rd.
N

PROPERTY OWNER'S NAME

MN. AIR NATIONAL Guard

Mailing address if different than property address indicated above.

4680 Viper Street
Duluth MN. 55811

DRILLING METHOD

☐ Cable Tool
☒ Auger
☐☐ Driven
☐ Rotary☐ Dug
☐ Jetted

DRILLING FLUID

None

USE

☐ Domestic
☐ Irrigation
☐ Test Well☒ Monitoring
☐ Public
☐ Dewatering☐ Heating/Cooling
☐ Industry/Commercial
☐ Remedial

CASING

☐ Steel
☒ Plastic

Drive Shoe?

☐ Yes ☒ No☒ Threaded ☐ Welded

HOLE DIAM.

CASING DIAMETER

2.0

in. to 5.5

WEIGHT

8.0

in. to 17.0

SCREEN

Make

Johnson

Type

Sch 40 PVC

Slot/Gauze

.010

Set between

15.5 ft. and 5.5 ft.

OPEN HOLE

from

ft. to

Diam.

2.0

Length

10.1

STATIC WATER LEVEL

6.2

ft. below

☐ above land surface

Date measured

5-6-95

PUMPING LEVEL (below land surface)

ft. after

hrs. pumping

g.p.m.

WELL HEAD COMPLETION

☐ Pitless adapter manufacturer☒ Casing Protection

6" x 7" Sch 40 Steel

Model

12 in. above grade

GROUTING INFORMATION

Well grouted?

☒ Yes ☐ No

Grout Material

Neat cement

☒ Bentonite

Bentonite

from 4.0 to 2.5

ft.

from 2.5 to 0

ft.

from 0 to 0

ft.

☐ yds. ☐ bags☐ yds. ☐ bags☐ yds. ☐ bags

NEAREST KNOWN SOURCE OF CONTAMINATION

feet

direction

type

Well disinfected upon completion? ☐ Yes ☐ No

PUMP

☒ Not installed

Date installed

Manufacturer's name

Model number

HP

Volts

Length of drop pipe

ft.

Capacity

g.p.m.

Pressure Tank Capacity

Type: ☐ Submersible ☐ L.S. Turbine ☐ Reciprocating ☐ Jet ☐

ABANDONED WELLS

Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

WELL CONTRACTOR CERTIFICATION

This well was drilled under my supervision and in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.

AMERICAN Engineering Testing Model 3
Licensee Business Name Lic. or Reg. No.J. S. 25 6-12-95
Authorized Representative Signature DateJAMIE TORIA 5-6-95
Name of Driller Date

GEOLOGICAL MATERIALS

COLOR

HARDNESS OF MATERIAL

FROM

TO

Top Soils: Hy Lamin

DARK

ORGANIC

Brown

Sandy silt with gravel

Brown

Cobbles + Boulders

Brown

4' to 5'

REMARKS, ELEVATION, SOURCE OF DATA, etc.

AMERICAN Engineering. Job #95-7091
El. By RREM INC.
Top of Riser. El 1422.90
Ground surface. El. 1420.44

MINN. DEPT. OF HEALTH COPY

564554

HE-01205-04 (Rev. 5/92)

APPENDIX D

WELL DEVELOPMENT, PURGING, AND SAMPLING LOGS

INTRODUCTION

This appendix contains the well development, purging, and sampling logs for the monitor wells installed during the Site Investigation for IRP Sites No. 25 and No. 26 at the Minnesota Air National Guard Base, Duluth, Minnesota.

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Well Development Log

Installation: Duluth ANGB

Well No.: 025-001MW

Client/Project:

Site: 25

Sample Start: (Date) 12 May 95

(Time): 1030

Sample End: (Date) 12 May 95

(Time): 1236

Developed By: J. Byrd, G. Wirtz

Background PID Reading: 0.0 ppm

PID Reading: 0.0 ppm

Depth to Water (BTOC): 21.78'

Depth to Bottom of Well (BTOC): 38.32'

Volume of Water in Well (gallons) = $(0/0408) \times (\text{well diameter (feet)}^2 \times \text{height of water column (feet)})$ $(16.54') (0.1632) = 2.7 \text{ gal.}$

Volume of Water in Well $\times 3 = 8.1 \text{ gal.}$

Development method: PVC Bailer (1st 7.5 gal.) stainless-steel submersible pump thereafter.

Development Water Containment: Plastic-lined, 55-gal. steel drum.

Average Rate of Removal of Water:

Weather: 70s, Sunny, Breezy.

Comments: Very silty, causing problems with stainless-steel submersible pump.
Never did clear up.

Time	Amount of Water Removed (gallons)	Temperature (° C)	pH	Conductivity (μS/cm)	Clarity (NTU)	Remarks
1053	7.5	12°	7.38	6.05		Cloudy
1104	10.0	12°	7.68	6.31		Cloudy
1110	12.5	12°	7.61	7.43		Cloudy
1122	15.0	12°	7.75	6.90		Cloudy
1130	17.5	12°	7.65	6.95		Cloudy
1137	20.0	12°	7.64	5.79		Cloudy
1145	22.5	12°	7.75	5.55		Cloudy
1153	25.0	12°	7.69	6.06		Cloudy
1201	27.5	12°	7.66	6.15		Cloudy
1208	30.0	12°	7.66	6.34		Cloudy
1215	32.5	12°	7.60	6.39		Cloudy
1222	35.0	12°	7.71	6.25		Cloudy
1231	37.5	12°	7.71	6.74	640,000	Cloudy

° C – Degrees Centigrade.

NTU – Nephelometer Turbidity Units.

μS/cm – microSiemens per centimeter.

pH – [p(otential) of H(ydrogen)].

Well Development Log

Installation: Duluth ANGB

Well No.: 025-002MW

Client/Project:

Site: 25

Sample Start: (Date) 12 May 95

(Time): 1308

Sample End: (Date) 12 May 95

(Time): 1513

Developed By: J. Byrd, G. Wirtz

Background PID Reading: 0.0 ppm

PID Reading: 0.0 ppm

Depth to Water (BTOC): 7.49'

Depth to Bottom of Well (BTOC): 15.98'

Volume of Water in Well (gallons) = $(0/0408) \times (\text{well diameter (feet)}^2 \times \text{height of water column (feet)}) (8.49') (0.1632) = 1.4 \text{ gal.}$

Volume of Water in Well x 3 = 4.2 gal.

Development method: PVC Bailer.

Development Water Containment: Plastic-lined, 55-gal. steel drum.

Average Rate of Removal of Water:

Weather: Partly cloudy, windy, cool.

Comments: Recharges slowly.

Time	Amount of Water Removed (gallons)	Temperature (° C)	pH	Conductivity (µS/cm)	Clarity (NTU)	Remarks
1321	4	8°	6.93	11.18		Very Cloudy
1332	6	8°	6.83	12.33		Clearing
1345	8	8°	6.65	12.27		Clearing
1355	10	8°	6.64	12.19	644,000	Silty, Cloudy
1405	12	8°	6.60	12.16	657,000	Silty, Cloudy
1415	14	8°	6.59	12.15		Silty, Cloudy
1425	16	8°	6.62	12.98	405,000	Silty, Cloudy
1435	18	8°	6.67	12.22	683,000	Silty, Cloudy
1444	20	8°	6.62	12.33		Silty, Cloudy
1454	22	8°	6.63	12.32		Silty, Cloudy
1503	24	8°	6.72	11.85		Silty, Cloudy
1510	26	8°	6.65	12.18		Silty, Cloudy

° C - Degrees Centigrade.

NTU - Nephelometer Turbidity Units.

µS/cm - microSiemens per centimeter.

pH - [p(otential) of H(ydrogen)].

Well Development Log

Installation: Duluth ANGB

Well No.: 025-003MW

Client/Project:

Site: 25

Sample Start: (Date) 12 May 95

(Time): 1530

Sample End: (Date) 12 May 95

(Time): 1735

Developed By: J. Byrd, G. Wirtz

Background PID Reading: 0.0 ppm

PID Reading: 80.0 ppm

Depth to Water (BTOC): 10.10'

Depth to Bottom of Well (BTOC): 21.94'

Volume of Water in Well (gallons) = (0/0408) x (well diameter (feet)² x height of water column (feet) (11.84') (0.1632) = 1.9 gal.

Volume of Water in Well x 3 = 5.8 gal.

Development method: PVC Bailer.

Development Water Containment: Plastic-lined, 55-gal. steel drum.

Average Rate of Removal of Water:

Weather: Partly cloudy, breezy (10-15 mph), cool.

Comments: Recharging slowly.

Time	Amount of Water Removed (gallons)	Temperature (° C)	pH	Conductivity (µS/cm)	Clarity (NTU)	Remarks
	6					
1547	8	9°	6.64	14.72		Very Cloudy
1559	10	9°	6.48	15.20		Very Cloudy
1610	12	9°	6.47	15.10		Very Cloudy
1617	14	9°	6.37	15.03		Very Cloudy
1627	16	9°	6.47	14.87		Very Cloudy
1638	18	9°	6.33	15.08		Very Cloudy
1650	20	9°	6.44	15.32	180,000	Clearing
1701	22	9°	6.37	15.26		Clearing
1717	24	9°	6.40	15.41		Clearing
1729	26	9°	6.39	15.89	175,000	Clearing

° C - Degrees Centigrade.

NTU - Nephelometer Turbidity Units.

µS/cm - microSiemens per centimeter.

pH - [p(otential) of H(ydrogen)].

Well Development Log

Installation: Duluth ANGB

Client/Project:

Sample Start: (Date) 10 May 95

Sample End: (Date)

Developed By: J. Byrd, Gary Wirtz

Background PID Reading: 0.0 ppm

Depth to Water (BTOC): 17.34'

Volume of Water in Well (gallons) = $(0/0408) \times (\text{well diameter (feet)}^2 \times \text{height of water column (feet)}) (6.55') (0.1632) = 1.07 \text{ gal.} = 1.1 \text{ gal.}$

Well No.: 026-001MW

Site: 25

(Time): 10:49 am

(Time): 11:55 am

PID Reading: 0.0 ppm

Depth to Bottom of Well (BTOC): (24.2') 23.89'

Volume of Water in Well x 3 = 3.3 gal.

Development method: PVC Bailer (1st 5 gals.) (Stainless-steel submersible pump thereafter).

Development Water Containment: Plastic-lined, 55-gal. steel drum.

Average Rate of Removal of Water:

Weather: Cloudy, 45° F, Wind 10 mph N.

Comments: Water Level: 19.11' (BTOC) after development.

Time	Amount of Water Removed (gallons)	Temperature (° C)	pH	Conductivity (μS/cm)	Clarity (NTU)	Remarks
1057	3	7°	8.06	4.18		Cloudy
1103	4	7°	7.91	4.51		Cloudy
1105	5	7°	7.72	4.74	698	Cloudy
1115	7	7°	7.64	5.13		Cloudy
1117	8	7°	7.63	4.50		Cloudy
1122	9	7°	7.62	5.42	477	Cloudy
1134	10	7°	7.41	5.51	688	Cloudy
1137	11	7°	7.39	5.14		Cloudy
1140	12	7°	7.35	5.13	39	Cloudy
1143	13	7°	7.34	5.38	522	Cloudy
1145	14	7°	7.34	5.26	469	Cloudy
1147	15	7°	7.31	5.13		Cloudy
1150	16	7°	7.32	5.31	236	Cloudy

(Concluded on next page)

Well Development Log (Concluded)
Well No.: 026-001MW
Duluth ANGB

Ending Water Level: 18.4 (BTOC) and Rising.

Comment: Stainless-steel submersible pumps dry in a matter of seconds on lowest setting. We pump, grab samples for parameters, and allow to recharge. Reached two-hour limit.

Time	Amount of Water Removed (gallons)	Temperature (° C)	pH	Conductivity (μS/cm)	Clarity (NTU)	Remarks
1153	17	7°	7.36	5.56	680	Cloudy
1330	18	7°	7.83	5.33	694	Cloudy
1333	20	7°	7.63	4.77		Cloudy
1337	22	7°	7.51	4.60	112	Clearing
1345	23	7°	7.63	4.64	51	Clearing
1350	24	7°	7.48	4.71	32	Clearing
1355	25	7°	7.46	4.69	35	
1400	26	7°	7.39	4.62	38	
1405	27	7°	7.40	4.75	57	
1411	28	7°	7.42	4.66	35	
1416	29	7°	7.42	4.68	25.7	NTU (x100)
1421	30	7°	7.41	4.71	21.1	NTU (x100)
1426	31	7°	7.41	4.73	31.9	NTU (x100)
1431	32	7°	7.33	4.81	32.5	NTU (x100)
1436	33	7°	7.34	4.72	12.7	NTU (x100)

° C – Degrees Centigrade.

NTU – Nephelometer Turbidity Units.

μS/cm – microSiemens per centimeter.

pH – [p(otential) of H(ydrogen)].

Well Development Log

Installation: Duluth ANGB

Well No.: 026-002MW

Client/Project:

Site: 26

Sample Start: (Date) 10 May 95

(Time): 1506

Sample End: (Date) 10 May 95

(Time): 1710

Developed By: J. Byrd, Gary Wirtz

Background PID Reading: 0.0 ppm

PID Reading: 0.0 ppm

Depth to Water (BTOC): 11.07'

Depth to Bottom of Well (BTOC): (19.4') 21.40'

Volume of Water in Well (gallons) = $(0/0408) \times (\text{well diameter (feet)}^2 \times \text{height of water column (feet)})$
 $(10.33') (0.1632) = 1.7 \text{ gal.}$

Volume of Water in Well x 3 = 5.1 gal.

Development method: PVC Bailer (1st 15 gals.) (Stainless-steel submersible pump).

Development Water Containment: Plastic-lined, 55-gal. steel drum.

Average Rate of Removal of Water:

Weather: Cloudy, 45° F, Wind 10 mph N.

Comments: Recal Hydac when pH drops below 7. Water level at 1710: 11.21' (BTOC) and rising.

Time	Amount of Water Removed (gallons)	Temperature (° C)	pH	Conductivity (µS/cm)	Clarity (NTU)	Remarks
1516	5	7°	7.24	3.2		Very Cloudy
1520	7	7°	7.04	2.9		Very Cloudy
1523	9	7°	6.94	2.86		Very Cloudy
1538	11	7°	6.45	2.86		Very Cloudy
1541	13	7°	6.53	2.87		Very Cloudy
1545	15	7°	6.55	2.88		Very Cloudy
1553	16.7	7°	6.62	3.05	788,000	Very Cloudy
1557	18.4	7°	6.73	3.13		Very Cloudy
1601	20.1	7°	6.65	2.99		Very Cloudy
1604	21.8	7°	6.65	2.98		Very Cloudy
1609	23.5	7°	6.80	3.16		Clearing

(Concluded on next page)

Well Development Log (Concluded)

Well No.: 026-002MW

Duluth ANGB

Time	Amount of Water Removed (gallons)	Temperature (° C)	pH	Conductivity (μ S/cm)	Clarity (NTU)	Remarks
1613	25.2	7°	6.74	3.09	679,000	Clearing
1617	26.9	7°	6.68	3.18	445,000	Clearing
1621	28.6	7°	6.68	3.09	356,000	
1625	30.3	7°	6.63	3.14	293,000	
1629	32.0	7°	6.66	3.22	249,000	
1633	33.7	7°	6.68	3.17	260,000	
1637	35.4	7°	6.63	3.02	400,000	
1641	37.1	7°	6.60	3.11	278,000	
1645	38.8	7°	6.65	3.07	248,000	
1649	40.5	7°	6.67	3.04	649,000	
1653	42.2	7°	6.67	3.07	380,000	
1657	43.9	7°	6.68	3.05	275,000	
1701	45.6	7°	6.67	4.39	208,000	
1705	47.3	7°	6.62	3.07	232,000	
1709	49.0	7°	6.63	3.05	229,000	

° C – Degrees Centigrade.

NTU – Nephelometer Turbidity Units.

μ S/cm – microSiemens per centimeter.

pH – [p(otential) of H(ydrogen)].

Well Development Log

Installation: Duluth ANGB

Well No.: 026-003MW

Client/Project:

Site: 26

Sample Start: (Date) 12 May 95

(Time): 0728

Sample End: (Date) 12 May 95

(Time): 0938

Developed By: J. Byrd, Gary Wirtz

Background PID Reading: 0.0 ppm

PID Reading: 0.0 ppm

Depth to Water (BTOC): 8.29'

Depth to Bottom of Well (BTOC): (15.5') 16.15'

Volume of Water in Well (gallons) = $(0/0408) \times (\text{well diameter (feet)}^2 \times \text{height of water column (feet)}) (7.86') (0.1632) = 1.3 \text{ gal.}$

Volume of Water in Well x 3 = 3.9 gal.

Development method: PVC Bailer.

Development Water Containment: Plastic-lined, 55-gal. steel drum.

Average Rate of Removal of Water:

Weather: Sunny, High in the 70s, Breeze 10-15 mph 5.

Comments: Bails dry (almost) 5-6 bailers.

Time	Amount of Water Removed (gallons)	Temperature (° C)	pH	Conductivity (μS/cm)	Clarity (NTU)	Remarks
0754	5	7°	7.49	4.30		Cloudy
0816	7.5	7°	7.05	3.94		Clearing
0829	10	7°	6.84	3.83	699,000	
0844	12.0	7°	6.39	3.99	201,000	
0850	13.0	7°	6.56	3.68	85,000	
0856	14.0	7°	6.48	3.88	112,000	
0902	15.0	7°	6.48	3.69	110,000	
0908	16.0	7°	6.46	3.64	184,000	
0914	17.0	7°	6.42	3.70	61,000	
0920	18.0	7°	6.47	3.71	199,000	
0926	19.0	7°	6.48	3.71	109,000	
0934	20.0	7°	6.49	3.71	119,000	

° C – Degrees Centigrade.

NTU – Nephelometer Turbidity Units.

μS/cm – microSiemens per centimeter.

pH – [p(otential) of H(ydrogen)].

Well Purging Log

Installation: Duluth ANGB

Well No.: 025-001MW

Client/Project:

Site: 25

Sample Start: (Date) 19 May 95

(Time): 1315

Sample End: (Date) 19 May 95

(Time): 1420

Developed By: Byrd, Greenway

Background PID Reading: 0.0 ppm

PID Reading: 0.0 ppm

Depth to Water (BTOC): 21.74'

Depth to Bottom of Well (BTOC): 39.28'

Volume of Water in Well (gallons) = $(0/0408) \times (\text{well diameter (feet)}^2 \times \text{height of water column (feet)}) (17.54') (0.1632) = 2.9 \text{ gal.}$

Volume of Water in Well x 3 = 8.6 gal.

Development method: Teflon™ Bailer.

Development Water Containment: Plastic-lined, 55-gal. steel drum.

Average Rate of Removal of Water:

Weather: Sunny, 70s.

Comments:

Time	Amount of Water Removed (gallons)	Temperature (° C)	pH	Conductivity (μS/cm)	Clarity (NTU)	Remarks
1353	9	9°	7.60	9.39		Cloudy
1400	12	9°	7.68	8.13		Cloudy
1409	15	9°	7.73	8.08		Cloudy
1417	18	9°	7.74	8.02		Cloudy

° C – Degrees Centigrade.

NTU – Nephelometer Turbidity Units.

μS/cm – microSiemens per centimeter.

pH – [p(otential) of H(ydrogen)].

Well Purging Log

Installation: Duluth ANGB

Well No.: 025-002MW

Client/Project:

Site: 25

Sample Start: (Date) 18 May 95

(Time): 1530

Sample End: (Date) 18 May 95

(Time): 1628

Developed By: Byrd, Greenway

Background PID Reading: 0.0 ppm

PID Reading: 0.0 ppm

Depth to Water (BTOC): 7.32'

Depth to Bottom of Well (BTOC): 18.80'

Volume of Water in Well (gallons) = $(0/0408) \times (\text{well diameter (feet)}^2 \times \text{height of water column (feet) (11.48') (0.1632)} = 1.9 \text{ gal.}$

Volume of Water in Well x 3 = 5.6 gal.

Development method: Teflon™ Bailer.

Development Water Containment: Plastic-lined, 55-gal. steel drum.

Average Rate of Removal of Water:

Weather: Sunny, 60s.

Comments:

Time	Amount of Water Removed (gallons)	Temperature (° C)	pH	Conductivity (µS/cm)	Clarity (NTU)	Remarks
1549	6	7°	6.80	12.12		
1602	8	7°	7.22	11.57		Slow Recharge
1613	10	7°	7.25	11.54		
1626	12	7°	7.21	11.45		

° C – Degrees Centigrade.

NTU – Nephelometer Turbidity Units.

µS/cm – microSiemens per centimeter.

pH – [p(otential) of H(ydrogen)].

Well Purging Log

Installation: Duluth ANGB

Well No.: 025-003MW

Client/Project:

Site: 25

Sample Start: (Date) 19 May 95

(Time): 1554

Sample End: (Date) 19 May 95

(Time): 1637

Developed By: Byrd, Greenway

Background PID Reading: 0.0 ppm

PID Reading: 17.0 ppm

Depth to Water (BTOC): 10.05'

Depth to Bottom of Well (BTOC): 22.35'

Volume of Water in Well (gallons) = (0/0408) x (well diameter (feet)² x height of water column (feet) (12.30') (0.1632) = 2.0 gal.

Volume of Water in Well x 3 = 6.0 gal.

Development method: Teflon™ Bailer.

Development Water Containment: Plastic-lined, 55-gal. steel drum.

Average Rate of Removal of Water:

Weather: Sunny, 70s.

Comments:

Time	Amount of Water Removed (gallons)	Temperature (° C)	pH	Conductivity (μS/cm)	Clarity (NTU)	Remarks
1612	6	6°	6.65	16.17		Cloudy
1618	8	6°	6.64	14.12		Cloudy
1628	10	6°	6.67	14.07		Cloudy
1634	12	6°	6.61	14.13		Clearing

° C – Degrees Centigrade.

NTU – Nephelometer Turbidity Units.

μS/cm – microSiemens per centimeter.

pH – [p(otential) of H(ydrogen)].

Well Purging Log

Installation: Duluth ANGB

Well No.: 026-001MW

Client/Project:

Site: 26

Sample Start: (Date) 18 May 95

(Time): 0840

Sample End: (Date) 18 May 95

(Time): 0932

Developed By: Byrd, Greenway

Background PID Reading: 0.0 ppm

PID Reading: 0.0 ppm

Depth to Water (BTOC): 17.05'

Depth to Bottom of Well (BTOC): 25.28'

Volume of Water in Well (gallons) = $(0/0408) \times (\text{well diameter (feet)}^2 \times \text{height of water column (feet)}) (8.23') (0.1632) = 1.3 \text{ gal.}$

Volume of Water in Well x 3 = 4.0 gal.

Development method: Bailer.

Development Water Containment: Plastic-lined, 55-gal. steel drum.

Average Rate of Removal of Water:

Weather: Sunny, 50s, Breezy.

Comments: Depth at end: 17.2' (BTOC) and rising.

Time	Amount of Water Removed (gallons)	Temperature (° C)	pH	Conductivity (µS/cm)	Clarity (NTU)	Remarks
0856	4	7°	7.21	5.18		Cloudy
0859	5	7°	7.25	4.72		Cloudy
0902	6	7°	7.28	4.83		Cloudy
0906	7	7°	7.28	4.93		Cloudy
0910	8	7°	7.34	4.89		Cloudy
0914	9	7°	8.09	5.21		Cloudy
0918	10	7°	7.65	4.75		Cloudy
0921	11	7°	7.49	4.74		Cloudy
0923	12	7°	7.45	4.71		Cloudy
0927	13	7°	7.41	4.85		Cloudy

° C – Degrees Centigrade.

NTU – Nephelometer Turbidity Units.

µS/cm – microSiemens per centimeter.

pH – [p(otential) of H(ydrogen)].

Well Purging Log

Installation: Duluth ANGB

Well No.: 026-002MW

Client/Project:

Site: 26

Sample Start: (Date) 18 May 95

(Time): 1044

Sample End: (Date) 18 May 95

(Time): 1125

Developed By: Byrd, Greenway

Background PID Reading: 0.0 ppm

PID Reading: 0.0 ppm

Depth to Water (BTOC): 9.74'

Depth to Bottom of Well (BTOC): 21.44'

Volume of Water in Well (gallons) = $(0/0408) \times (\text{well diameter (feet)}^2 \times \text{height of water column (feet) (11.7') (0.1632)} = 1.9 \text{ gal.}$

Volume of Water in Well x 3 = 5.7 gal.

Development method: Teflon™ Bailer.

Development Water Containment: Plastic-lined, 55-gal. steel drum.

Average Rate of Removal of Water:

Weather: Sunny, 50s, Breezy.

Comments: Depth at end: 9.72' (BTOC).

Time	Amount of Water Removed (gallons)	Temperature (° C)	pH	Conductivity (μS/cm)	Clarity (NTU)	Remarks
1101	6	6°	7.40	3.04		Cloudy
1109	8	6°	7.27	2.62		Cloudy
1113	10	6°	7.17	2.61		Cloudy
1119	12	6°	7.16	2.58		Cloudy
1123	14	6°	7.13	2.60		Cloudy

° C – Degrees Centigrade.

NTU – Nephelometer Turbidity Units.

μS/cm – microSiemens per centimeter.

pH – [p(otential) of H(ydrogen)].

Well Purging Log

Installation: Duluth ANGB

Well No.: 026-003MW

Client/Project:

Site: 26

Sample Start: (Date) 18 May 95

(Time): 1220

Sample End: (Date) 18 May 95

(Time): 1309

Developed By: Byrd, Greenway

Background PID Reading: 0.0 ppm

PID Reading: 0.0 ppm

Depth to Water (BTOC): 7.20'

Depth to Bottom of Well (BTOC): 17.94'

Volume of Water in Well (gallons) = $(0/0408) \times (\text{well diameter (feet)}^2 \times \text{height of water column (feet)})$
 $(10.74') (0.1632) = 1.8 \text{ gal.}$

Volume of Water in Well $\times 3 = 5.3 \text{ gal.}$

Development method: Teflon™ Bailer.

Development Water Containment: Plastic-lined, 55-gal. steel drum.

Average Rate of Removal of Water:

Weather: Sunny, 60s, Breezy.

Comments: Recharging slower than others.

Time	Amount of Water Removed (gallons)	Temperature (° C)	pH	Conductivity (μS/cm)	Clarity (NTU)	Remarks
1234	5	6°	6.97	7.18		Clear
1239	7	6°	6.96	3.93		Clear
1244	9	6°	6.97	3.76		Clear
1251	11	6°	6.97	3.89		Clear
1304	13	6°	6.95	3.82		Clear

° C – Degrees Centigrade.

NTU – Nephelometer Turbidity Units.

μS/cm – microSiemens per centimeter.

pH – [p(otential) of H(ydrogen)].

Well Sampling Log

Installation: Duluth ANGB

Well No.: 025-001MW

Client/Project:

Site: 25

Sample Start: (Date) 19 May 95

(Time): 1503

Sample End: (Date) 19 May 95

(Time):

Sampled By: J. Byrd, D. Greenway

Background PID Reading: 0.0 ppm

PID Reading: 0.0 ppm

Depth to Water (BTOC): 22.05'

Screen Interval:

Sampling Method: Teflon™ Bailer

Sampling Equipment Decontamination method: Liqui-Nox, Potable water rinse, DI Water Rinse.

Lab Analyses:

VOCs – SW8010/8020

Metals – SW7421, SW6010, SW7196, SW7470

SVOCs – SW8270

QA/QC Samples:

Weather: Sunny, 70s

Comments:

Well Sampling Log

Installation: Duluth ANGB

Well No.: 025-002MW

Client/Project:

Site: 25

Sample Start: (Date) 18 May 95

(Time): 1654

Sample End: (Date) 18 May 95

(Time): 1705

Sampled By: J. Byrd, D. Greenway

Background PID Reading: 0.0 ppm

PID Reading: 0.0 ppm

Depth to Water (BTOC): 7.39'

Screen Interval:

Sampling Method: Teflon™ Bailer

Sampling Equipment Decontamination method: Liqui-Nox, Potable water rinse, DI Water Rinse.

Lab Analyses:

VOCs – SW8260

SVOCs – SW8270

Metals – SW7421, SW6010, SW7196, SW7470

QA/QC Samples:

Weather: Sunny, 60s, Breezy.

Comments:

Well Sampling Log

Installation: Duluth ANGB

Well No.: 025-003MW

Client/Project:

Site: 25

Sample Start: (Date) 19 May 95

(Time): 1706

Sample End: (Date) 19 May 95

(Time): 1720

Sampled By: J. Byrd, D. Greenway

Background PID Reading: 0.0 ppm

PID Reading: 8.0 ppm

Depth to Water (BTOC): 14.01'

Screen Interval:

Sampling Method: Teflon™ Bailer

Sampling Equipment Decontamination method:

Lab Analyses:

SVOCs – SW8270

VOCs – SW8010, SW8020

Metals – SW7421, SW6010, SW7196, SW7470

QA/QC Samples:

025-003RB @ 1532

025-003AMW @ 1715

Weather:

Comments:

Well Sampling Log

Installation: Duluth ANGB

Well No.: 026-001MW

Client/Project:

Site: 26

Sample Start: (Date) 18 May 95

(Time): 1012

Sample End: (Date) 18 May 95

(Time): 1020

Sampled By: J. Byrd, D. Greenway

Background PID Reading: 0.0 ppm

PID Reading: 0.0 ppm

Depth to Water (BTOC): 17.2'

Screen Interval:

Sampling Method: Teflon™ Bailer

Sampling Equipment Decontamination method: Liqui-Nox, Rinse with Potable Water, Rinse with DI Water.

Lab Analyses:

SVOCs – SW8270

VOCs – SW8260

QA/QC Samples:

SI – 001FB

Weather: Sunny, Breezy, 50s.

Comments:

Well Sampling Log

Installation: Duluth ANGB

Well No.: 026-002MW

Client/Project:

Site: 26

Sample Start: (Date) 18 May 95

(Time): 1125

Sample End: (Date) 18 May 95

(Time): 1144

Sampled By: J. Byrd, D. Greenway

Background PID Reading: 0.0 ppm

PID Reading: 0.0 ppm

Depth to Water (BTOC): 9.74'

Screen Interval:

Sampling Method: Teflon™ Bailer

Sampling Equipment Decontamination method: Liqui-Nox, Rinse with Potable Water, Rinse with DI Water.

Lab Analyses:

VOCs – SW8260

SVOCs – SW8270

QA/QC Samples:

None

Weather: Sunny, Breezy, 80s

Comments:

Well Sampling Log

Installation: Duluth ANGB

Well No.: 026-003MW

Client/Project:

Site: 26

Sample Start: (Date) 18 May 95

(Time): 1333

Sample End: (Date) 18 May 95

(Time): 1355

Sampled By: J. Byrd, D. Greenway

Background PID Reading: 0.0 ppm

PID Reading: 0.0 ppm

Depth to Water (BTOC):

Screen Interval:

Sampling Method: Teflon™ Bailer

Sampling Equipment Decontamination method: Liqui-Nox, Potable water rinse, DI water rinse.

Lab Analyses:

VOCs – SW8260

SVOCs – SW8270

QA/QC Samples:

026-003RB – taken at 1212

026-003AMW – 6W01

Weather:

Comments:

APPENDIX E

AQUIFER SLUG TEST DATA ANALYSIS

E.1 INTRODUCTION

Six aquifer slug tests on six monitor wells were performed to investigate the hydraulic properties of the unconsolidated glacial till. A detailed description of the data collection and analysis is presented in the following sections.

The slug test method is used to obtain data necessary to calculate the hydraulic conductivity of the subsurface material around the screened portion of a well. The technique is based on measurements of the water level as a function of time after withdrawing a slug of known volume from the monitor well. Both rising-head and falling-head test methods were run on each well. However, only rising-head test data is used to evaluate and interpret the hydraulic properties of the aquifer at both IRP sites.

E.2 AQUIFER SLUG TEST PROCEDURE

The equipment used for slug testing included a Hermit Environmental Data Logger model 1000C manufactured by *In Situ*, Inc., of Laramie, Wyoming. Also used was a pressure transducer model PTX-161, manufactured by *In Situ*, Inc. An acrylic slug that was 1.25 inches in diameter and 4 feet in length was used to produce the initial water displacement.

Prior to testing, the well was developed and the water level allowed to stabilize. The slug was decontaminated using standard procedures prior to performing the slug test.

Immediately upon opening, the headspace of the well to be slug tested was tested for volatile organic vapors and lower explosive limit and oxygen percentages using a photoionization detector and explosimeter respectively. Next, the initial water level was measured and recorded in the field logbook and the pressure transducer was placed in the well and allowed to equilibrate. The proper operating parameters such as time, date, test number, sample rate, number of inputs, data type, and scale factor and offset values of the transducer were inserted to properly program the data logger for the slug test. The decontaminated slug was rapidly lowered into the well in such a manner as to minimize turbulence and splashing. The injection of the slug created a nearly instantaneous rise in the water level or hydraulic head as well as some transient oscillations (minimized by the smooth slug injection). After the initial rise, the water level of the well dropped as it returned to equilibrium. The water level altitudes were recorded by the data logger.

After equilibrium was attained, the slug was rapidly and smoothly removed from the well and the subsequent rise of the water level in the well versus the time since the start of the test was also recorded by the data logger.

After the slug test was completed, the data was downloaded onto a computer and printed out by a portable printer.

E.3 SLUG TEST DATA ANALYSIS METHODS

The method used for analysis of the slug test data depends on the setting of the monitor well being tested. For monitor wells in unconfined conditions, the Bouwer and Rice (1976) method is the appropriate method to use for reduction of the slug test data to determine values of hydraulic conductivity. The Bouwer and Rice method can also be used for semi-confined and confined conditions (Bouwer, 1989). Because of the heterogeneous nature of the lenticular stratigraphy and discontinuous layers of intermixed clays, silts, sands, and gravel which are representative of glacial stratigraphy, some uncertainty exists whether the hydrologic unit is defined as an unconfined, semi-confined, or confined aquifer.

The data plots and data reduction for both methods discussed in the previous paragraph were accomplished using the AQTESOLV software package Version 2.0 developed by Geraghty & Miller (1994).

The slug test data analyses using Bouwer and Rice (1976) method is presented in this section. The slug test results are presented in Section E.4.

The method described by Bouwer and Rice (1976) is used to calculate the hydraulic conductivity of an aquifer or hydrologic unit in the vicinity of a well screen from the rate of rise or fall of the water level or hydraulic head in the well after a known volume or "slug" is suddenly injected or withdrawn. This particular method is based on the following assumptions: (1) drawdown of the water table around the well is negligible, (2) flow above the water table (in the capillary fringe) can be ignored, (3) head losses as water enters the well (well losses) are negligible, and (4) the aquifer is homogeneous and isotropic.

The rate of flow of groundwater into a well after the water level has been lowered a distance, y , below the static water table around the well is calculated using the Thiem equation (Equation 1).

$$Q = 2\pi KL \frac{y}{\ln(R_e/r_w)}, \text{ where} \quad (1)$$

Where:

- Q = rate of flow into the well;
- π = 3.14159, the ratio of the circumference to the diameter of a circle.
- K = hydraulic conductivity of the hydrologic unit in the vicinity of the well screen;
- L = length of screened interval;
- y = vertical difference between water level inside the well and the static water level outside the well;
- R_e = effective radial distance over which y is dissipated; and
- r_w = radial distance to the undisturbed portion of the hydrologic unit from the centerline of the well.

The value of r_w is the radius of the screened section of the well plus the thickness of the sand pack and the developed zone around the well. Because the take only the thickness of the sand pack into account (Bouwer, 1989).

The rate of rise of the water level (dy/dt) in the well after the water level has been quickly lowered can be regarded as:

$$\frac{dy}{dt} = \frac{-Q}{\pi r_c^2} \quad (2)$$

- dy/dt = rate of rise of the water level within the well;
- Q = volume rate of flow into well;
- π = 3.14159, the ratio of the circumference to the diameter of a circle; and
- r_c = radius of the casing.

If the water level rises in the screened section of the well with a sand pack around it, then the thickness and porosity of the sand pack should be taken into account when calculating the equivalent value of r_c for the rising water level. The equivalent value of r_c is then calculated using Equation (3) if the water level is within the screened interval of the well.

$$r_c = [(1 - n)r_c^2]^{1/2}, \text{ where} \quad (3)$$

- n = porosity of the sand pack;
- r_c = radius of the casing;
- r_w = radius distance to the undisturbed portion of the aquifer from the centerline of the well.

By solving Equation (2) for Q , and using it in Equation (1), it is possible to integrate, and solve for hydraulic conductivity, K , in Equation (4).

$$K = r_c^2 \ln \frac{(R_e/r_w)}{2L} \frac{1}{t} \ln \frac{y_o}{y_t}, \text{ where} \quad (4)$$

- K = Hydraulic conductivity;
- r_c = radius of casing;
- R_e = effective radial distance over which y is dissipated;
- r_w = radial distance to the undisturbed portion of the aquifer from the centerline of the well;
- y_o = y at time zero; and
- y_t = y at time t .

This equation was used to calculate hydraulic conductivity of the sediments of Site 10.

Values of R_e , effective radius, for various system geometries are expressed in terms of the dimensionless ratio $\ln(R_e/r_w)$ and were determined empirically with an electrical resistance network analog for different values of r_w , L , length of water column in the well, H , and hydrologic unit thickness, b , (Bouwer and Rice, 1976). The data are used in one of two equations: Equation (5) is used when H is less than b , and Equation (6) when H is equal to b . These equations are:

$$\ln \frac{R_e}{r_w} = \left[\frac{1.1}{\ln(H/r_w)} + \frac{A + B \ln[(b - H)/r_w]}{L/r_w} \right]^{-1}, \text{ and} \quad (5)$$

$$\ln \frac{R_e}{r_w} = \left[\frac{1.1}{\ln(H/r_w)} + \frac{C}{L/r_w} \right]^{-1}, \text{ where} \quad (6)$$

A, B, and C = dimensionless values as a function of L/r_w ;

R_e = Effective radial distance over which y is dissipated;

r_w = Radial distance to the undisturbed portion of the aquifer from the center line of the well;

H = length of water column in the well;

b = hydrologic unit thickness; and

L = length of screened interval.

Because y and t are the only variables in Equation (4), a plot of $\ln y$ versus t semilogarithmic paper may be used to determine $[\ln(y_o/y_i)]/t$. The straight line through the data points can also be used to select two values of y , namely y_o and y_i , along the time interval t for substitution into Equation (4). Because drawdown of the groundwater table around the well increases exponentially and time increases linearly as the test progresses, the points begin to deviate from the straight line for large t and small y . Thus, only the linear portion of the curve should be used to evaluate $[\ln(y_o/y_i)]/t$ for the calculation of K using Equation (4) (Bouwer, 1989).

E.4 SLUG TEST RESULTS

The graphs illustrating the plotted displacement values versus time are presented in this section. The computed hydraulic conductivity values for the monitor wells at IRP Sites No. 25 and No. 26 are presented in Table E.1.

Table E.1
Slug Test Results, IRP Sites No. 25 and No. 26
148th FW, Duluth ANGB, Duluth, Minnesota

Monitor Well	Hydraulic Conductivity (ft/min)	Hydraulic Conductivity (gpd/ft ²)
IRP Site No. 25		
025-001MW	9.946×10^{-4}	10.9
025-002MW	8.604×10^{-4}	9.26
025-003MW	3.043×10^{-4}	3.28
IRP Site No. 26		
026-001MW	9.481×10^{-3}	102
026-002MW	2.926×10^{-2}	315
026-003MW	1.442×10^{-3}	15.5

ft/min – feet per minute.

gpd/ft² – gallons per day per square foot.

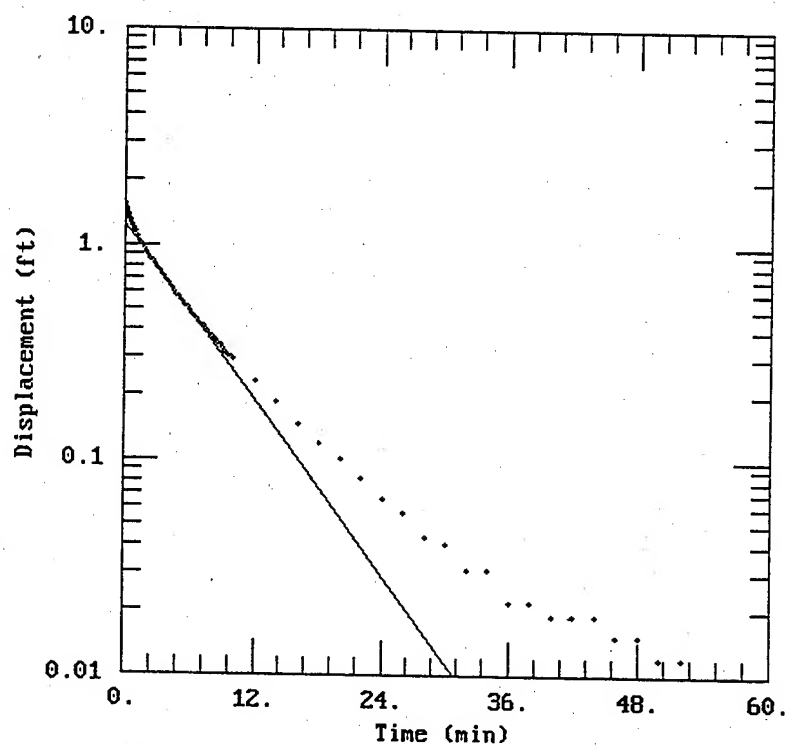
CLIENT: HQ ANG/CEVR

COMPANY: OpTech

LOCATION: Duluth ANGB - Site 25

PROJECT: 1315-197

025-001MW



DATA SET:
25-001MW.DAT
08/17/95

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

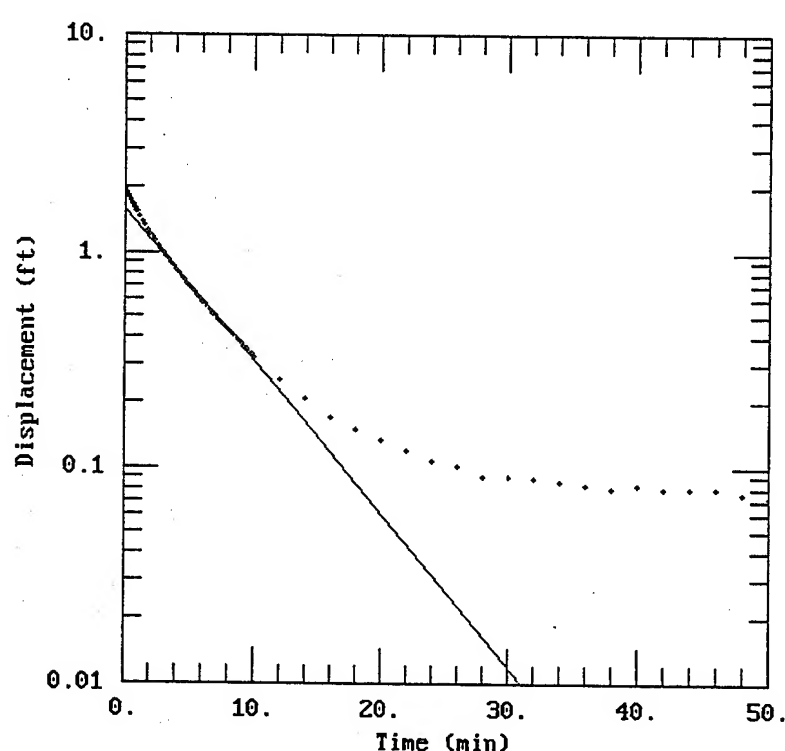
TEST DATA:
 $H_0 = 1.531$ ft
 $r_c = 0.0833$ ft
 $r_w = 0.375$ ft
 $L = 10.$ ft
 $b = 17.$ ft
 $H = 16.76$ ft

PARAMETER ESTIMATES:
 $K = 0.0009946$ ft/min
 $y_0 = 1.246$ ft

AQTESOLV

CLIENT: HQ ANG/CEUR	COMPANY: OpTech
LOCATION: Duluth ANGB - Site 25	PROJECT: 1315-197

025-002MW



DATA SET:
25-002MW.DAT
08/17/95

AQUIFER MODEL:
Unconfined
SOLUTION METHOD:
Bouwer-Rice

TEST DATA:
H₀ = 1.986 ft
r_c = 0.083 ft
r_w = 0.375 ft
L = 10. ft
b = 12. ft
H = 10.1 ft

PARAMETER ESTIMATES:
K = 0.0008604 ft/min
y₀ = 1.559 ft

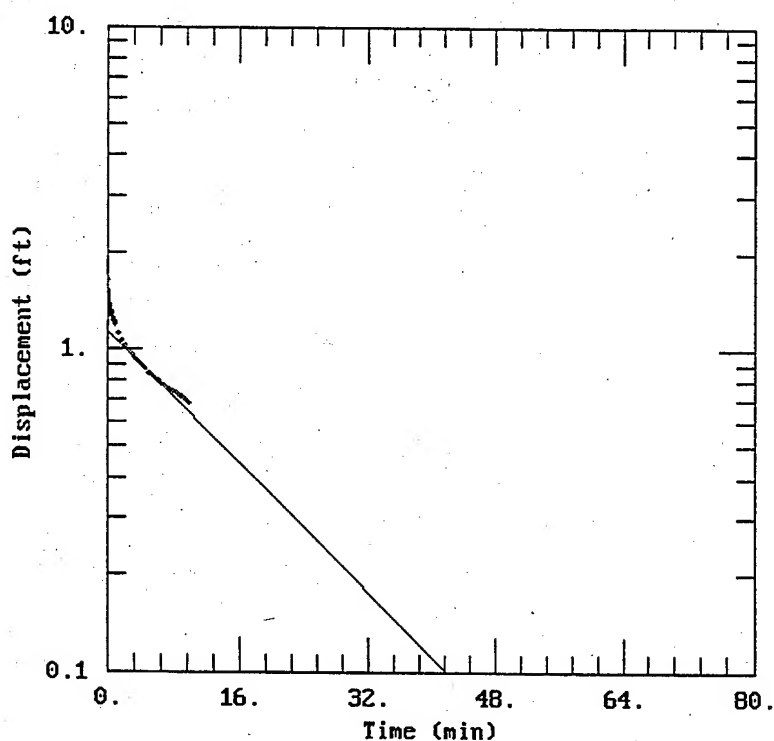
CLIENT: HQ ANG/CEVR

COMPANY: OpTech

LOCATION: Duluth ANGB - Site 25

PROJECT: 1315-197

025-003MW



DATA SET:
25-003MW.DAT
08/17/95

AQUIFER MODEL:
Unconfined
SOLUTION METHOD:
Bouwer-Rice

TEST DATA:
 $H_0 = 1.627$ ft
 $r_c = 0.083$ ft
 $r_w = 0.375$ ft
 $L = 10.$ ft
 $b = 15.$ ft
 $H = 11.1$ ft

PARAMETER ESTIMATES:
 $K = 0.0003043$ ft/min
 $y_0 = 1.126$ ft

AQTESOLV

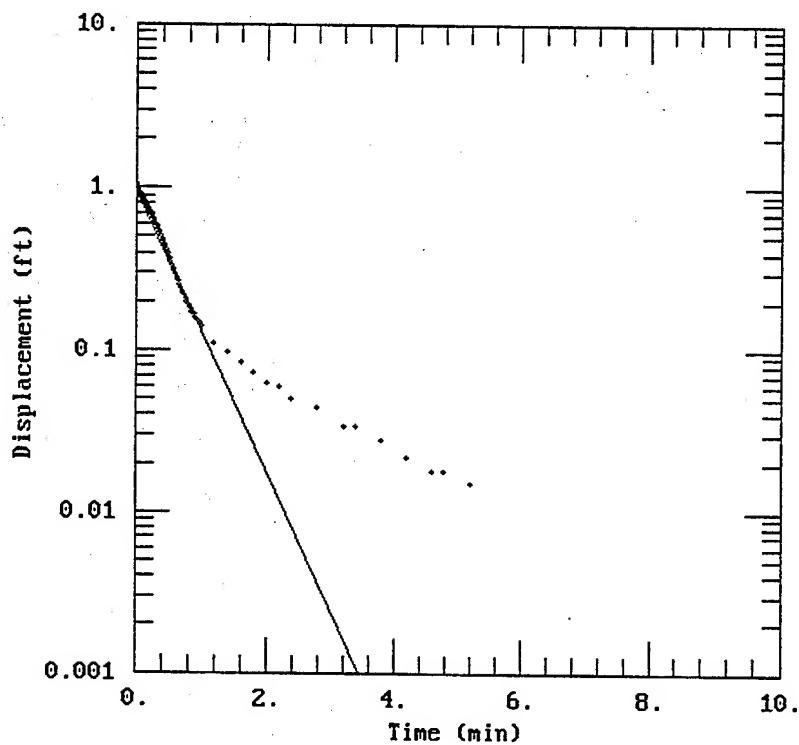
CLIENT: HQ ANG/CEUR

COMPANY: OpTech

LOCATION: Duluth ANGB - Site 26

PROJECT: 1315-197

026-001MW



DATA SET:
26-001MW.DAT
08/17/95

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

TEST DATA:
 $H_0 = 1.05$ ft
 $r_c = 0.083$ ft
 $r_w = 0.375$ ft
 $L = 10.$ ft
 $b = 18.$ ft
 $H = 8.25$ ft

PARAMETER ESTIMATES:
 $K = 0.009481$ ft/min
 $y_0 = 0.9395$ ft

AQTESOL

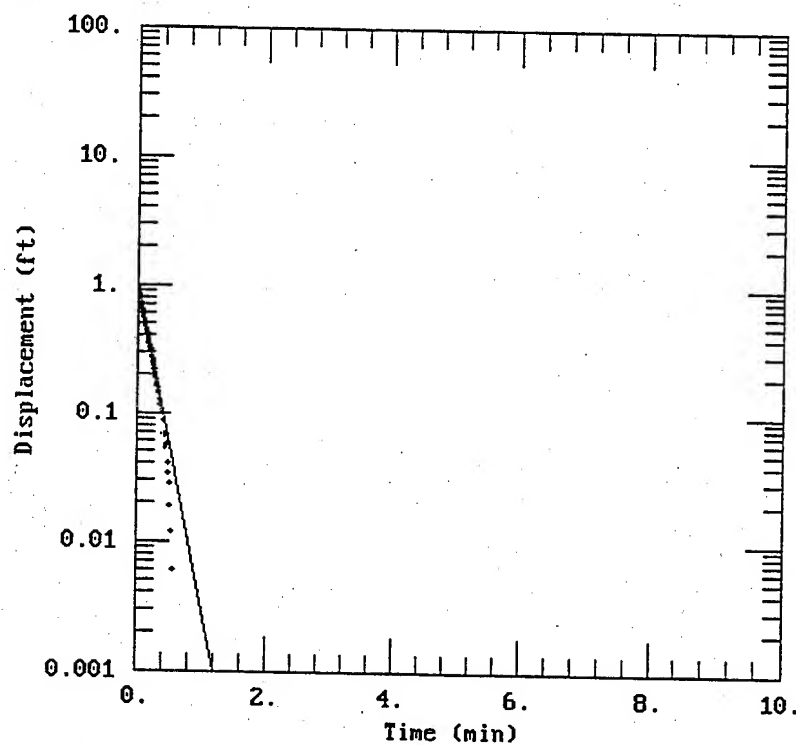
CLIENT: HQ ANG/CEVR

COMPANY: OpTech

LOCATION: Duluth ANGB - Site 26

PROJECT: 1315-197

026-002MW



DATA SET:
26-002MW.DAT
08/18/95

AQUIFER MODEL:
Unconfined
SOLUTION METHOD:
Bouwer-Rice

TEST DATA:
 $H_0 = 0.998$ ft
 $r_c = 0.083$ ft
 $r_w = 0.375$ ft
 $L = 10.$ ft
 $b = 29.$ ft
 $H = 11.9$ ft

PARAMETER ESTIMATES:
 $K = 0.02926$ ft/min
 $y_0 = 1.006$ ft

AQTESOLU

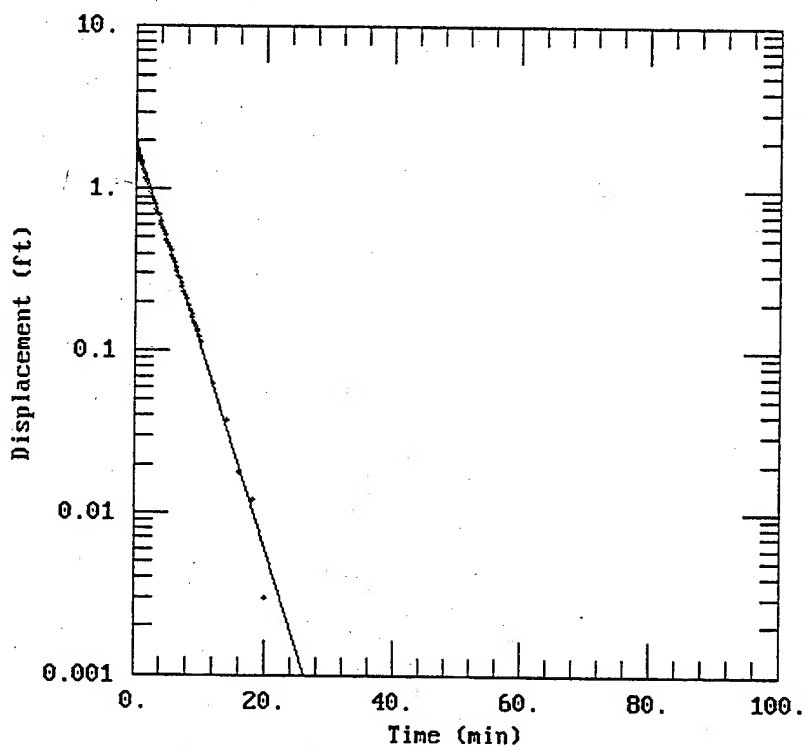
CLIENT: HQ ANG/CEUR

COMPANY: OpTech

LOCATION: Duluth ANGB - Site 26

PROJECT: 1315-197

026-003MW



DATA SET:
26-003MW.DAT
08/17/95

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

TEST DATA:
 $H_0 = 1.947$ ft
 $r_c = 0.083$ ft
 $r_w = 0.375$ ft
 $L = 10.$ ft
 $b = 29.$ ft
 $H = 10.6$ ft

PARAMETER ESTIMATES:
 $K = 0.001442$ ft/min
 $y_0 = 1.902$ ft

AQTESOLV

APPENDIX F

FIELD LOG BOOK DATA

INTRODUCTION

Field logbooks were maintained by Operational Technologies Corporation (OpTech) personnel for documentation of the field activities for the Site Investigation at Duluth Air National Guard Base, Duluth, Minnesota. The field work was conducted between 1 May 1995 and 20 May 1995.

THIS PAGE INTENTIONALLY LEFT BLANK

Kathryn Peitche-H

Duluth 57
1315-197

RECEIVED BY THE POST OFFICE

ADULTS

CHILDREN

Monday 5/1/95

Q

Added to Dutch in notebook

Anna Maria - Kathryn
Puzzetti

Libtarianism.

Divided into Dutch, A.V.C.B.

Healing time to return.

247

John Capt. Stive. Cultivator.

he was going to leave the ship

Large or two birds - 11

will be lying in wonder

May 14th 1945, Keys well.

höl hin deck

Survived at Base Camp

Hygienic Policy to milit.

Bull Bay. He informed

me that all utilities that

referred. Please address to

have been considered, and

These calculations will be

cleaned timber; 2000

will be checked tomorrow

کے لئے جو کچھ ہے

ה'תש"ח

2000 10000

(2)

5/1/95

1430

Arrived at Base Security.
Talked to Capt. Korach
about schedule at site

1440

Joe Byrd, Jr. and
Destiny Greenway
arrived at Duluth
ANGB.

1445 -

1445 -
1620

Staked soil boring
and monitor well locations

1630

Left Duluth ANGB.

(3)

Tuesday 5/2/95

715

Depart hotel

730

Breakfast and
morning meeting

830

Arrived at Duluth ANGB
Kathleen Marino

Joe Byrd, Jr.

Destiny Greenway
Kathryn Pritchett

640

Stopped by Base Civil
Engineer - Bruce King

in a meeting until 1015.
Arrived at headquarters

850

to meet Capt. Stett
University to obtain
key for Bldg. 247
Phone called.

Optech office to acquire
airbill # for box
sent out Friday from
office. The box

(Lays + prints, etc.)
did not arrive at
the hotel.

Box did not leave the
office until ~ noon
yesterday.

Kathryn Pritchett

(4)

5/2/95

Airbill # 5344094/03

• Call FedEx - should deliver at 900 today

• Staked Site 21

021-026 BH

021-027 BH

021-028 BH

• marked stakes for

Sites 24 & 17

Arrived at Site 26

Joe Sydnor, Jr.

Kathleen Marino

Denny Greenway

Kathy Pizzetti

Buce < Bruce Berg

• Finished staking - off Site 26

• Put up supplies

Lunch

Returned to Duluth

ANGS

Called American Engineering

Testing (Dillers)

Left message

KP

Kathy Pizzetti

5/2/95

(5)

Called Beth Curry (MPLA) to discuss the following:

• the criteria for TPH

for Sites 17 & 21

is 100 ppm

• she will check

with Luke (GA/QC)

about the Wisconsin

CRO/DRO method

for TPH

waited over Sites 27 &

21 with Bruce Berg

called ~~Mark Escobar~~

Mark Escobar (Optech)

to confirm that the

contact for the geotechnical

lab is in place at the

contact person is Joe

Palo (216) 741-4290

Called Dillers to

confirm meeting at

the Base by 7:30.

Kathleen Marino &

Kathryn arrived at Site 17

to take baseline locations

Kathy Pizzetti

1300 -

1330

1330 -

1430

1430

1445

1525

(6)

5/2/95

1625
1640

Left Site 17
Arrived at Duluth

ANGB.

1700

Left Duluth ANGB.

Wednesday 5/3/95

(7)

645

Arrived at Duluth
ANGB

Kathleen Marine
Destiny Greenway
Joe Sydnor Jr.
Kathryn Pittman

Weather: Cloudy, Temp: low
40s - 50s

700

Check with Bruce

Beng (Base Civil

Engineer) about

Clearance for Site 26

→ all clear except

26 - 001m needs to

be moved ^{due to utility} ~~disposal~~

705

Called ~~Utility~~ Authority

Talked to Rudy Winters;

inform them of our presence?

project at Site 26 - we

should be drilling at Site

26 from 3 May - 5 May

1995.

719

Calibrated FID's

Determinator

48961-222

48962-222

X Kathryn Pittman

X Kathryn Pittman

5/3/95

(6)

Decontamination 100 ppm
Lot # 408302 - 412503 - 46

Environmental Instruments Co.
Explorimeter - industrial
Scientific MX251

910/059-002

Amesigan Engineering Testing

James Turner

Gary Mantel
Jonathan Gabriel

Arrived on site
Drellers setting up

to decontaminate

drill rig and augers

on side south of

Blk 246

Kathleen & Kathleen

meins will document

decontamination procedures

of drill rig and augers

Arrived at Headquarters

to talk to Capt.

Wabinsky about drums.

The 24 drums that were

available are being used.

~ 12 drums are in field

new - Blk 247

Kathy Patelet

new - Blk 247

new - Blk 247

5/3/95

(7)

Drellers finished
decontaminating drill
rig and augers.

Blanch

Arrived at Site 2 Co

Health & Safety

Meeting

James Turner

Gary Mantel

Jonathan Gabriel

Kathleen Meins

Darryl Greenway

De Byrd Jr.

Kathy Patelet

Started 026 - 006.BH1

Collected 0.5 - 2.5'

Encountered boulder

at 3.5' BLS - moved 1.5' south

0 LEL 70.2 % O₂

0 ppm

0 LEL 20.9 % O₂

0 ppm

Collected 5-7' Antennal

0 ppm

Kathy finished

(10)

5/3/95

Borehole

LEL 0 LEL
20.8% O₂

0 ppm

Poor Recovery on 8-10'
Collected 10-12' Antennal
0 LEL 20.8% O₂

1319

0 ppm

Photo Kathleen Morris
collecting a soil
sample at 11.5-
12' Antennal

1326

Moving Drill
to 026-005BH

1342

Started 026-005BH

1344

Collected 0.5-2.5'
0 LEL 20.8% O₂

Borehole

0 ppm

Photo Collecting

0.5-2.5' Antennal

1350

Collected 5-7' Antennal
0 LEL 20.8% O₂

0 ppm

1355

Collected 8-10' Antennal

0 ppm

Kathleen Morris

(11)

5/3/95

Moved to 026-004BH
Started 026-004BH

1415

Collected 0.5-2.5'
0 LEL 20.8% O₂

1430

0 ppm
Collected 5-7'
Collected 8-10'
0 LEL 20.8% O₂

1438

1448

0 ppm
Moved to 026-001BH
Collected 0.5-2.5'
0 LEL 20.8% O₂

1510

1518

0 ppm

1525

Collected 5-7'
0 LEL 20.8% O₂

0 ppm

0% Recovery on 0.5-2.5'
4 5-7'

Collected 8-10'

1530

Collected 0.5-2.5'
next to 026-001BH

1538

Collected 5-7'

1542

0 LEL 20.8% O₂

0 ppm

Kathleen Morris

(12)

1615

Dillene depart
Site 26

1623

Depart
and Depart from
Federal Express

1745

5/3/95

Kathy Pittsott

Thursday 5/4/95

(13)

Weather: Cloudy, low 40's
thunderstorms expected in
afternoon.

645 Arrived Duluth ANG B

Joe Byrd, Jr.
Kathleen Marino

Destry Greenway

Kathy Pittsott

Calibrated PID

715

same procedure as
outlined on pages 7-8
of this field logbook
arrived at headquarters
to discuss with Capt.
Walravens and Paul
Wheeler (ANG/CEUR)

725

about TD of soil
borings at Site 26.
Work Plan states to
drill to water table or
10 feet BLS. We drill
to 10 feet BLS yesterday
without encountering
saturated soil (moist soils).

Kathy Pittsott

(14)

5/4/95

We have two soil borings remaining — we will drill ~ 15' to search for water (believe to be ~ 12' BLS) on the next soil boring. If we fail to encounter water — then we will start 026-001 mud to determine water level.

730
800

Drillers arrived.
Drillers at fire department to fill up 200-gallon water tank.

815

Drillers decontaminating the augers. Destroying Greenway is decontaminating the procedures.

830P
840

Called Base Security to meet us at FOD area.

848
855

arrived at Site 26 Health & Safety meeting

Kathy Pitelott

(15)

5/4/95

OpTech / Kathleen Marine- Joe Byrd, Jr.
Destroy Greenway
Kathy Pitelott
American Engineering Testing / Jamie Turner
Greenway destroyed
Jordan Calil

914

checked water in boreholes

no water

026-006 BH

026-005 BH

026-004 BH

6.80' BLS 026-001 BH

920

Drillers spotted at

026-002 BH

922

Started Drilling

930

Collected 0.5'-2.5'

935

5% Recovery

935

Collected 5'-7'

935

0 LEL 20.5% O₂

935

0 ppm

935

W.C. 6.70' BLS

935

Only 50% Recovery

935

Kathy Pitelott

(16)

5/4/95

We will re-collect
0.5-2.5' and
4-6' interval due
to poor recovery.
Collected 0.5-2.5'

950

poor recovery
Collected 4-6',
35%

955

OLEL 20.8% O₂

0 ppm

Collected 0.5-2.5'
OLEL 20.8% O₂

1005

0 ppm

called Russ Cason
(Optech) about the
drillers using
Diamond Drilling to
cut pad from asphalt

— 026 ± 001 ml
Russ will check with
Norme & John morris,
Drillers moved to

1055

026 - 003 ~~ml~~ B4
Started drilling
5/11/95

Kathy Pastorek

(17)

5/4/95

Collected 0.5-2.5'

0 ppm

OLEL 20.8% O₂

Collected 5-7'

0 ppm

OLEL 20.8% O₂

For Russ Cason, John morris,
& Norme Cough — the
drillers can have Diamond

Drill for cutting pad area
for 026 - as shown as long
as there is proof of

insurance.

stopped Drilling

left Site 2-4-26

left Duluth SPANGB

lunch

arrived at Duluth ANGOS

contacted Base Security

for escort to Site 26

Arrived at Site 26

Destiny Greenway

Kathleen Merino

Kat Loya PRtduct

Kathy Pastorek

(18)

5/4/95

Diamond Drill had arrived at 1215 and stayed on Site 26 until 1245.

Drillers were starting to grout boreholes with 97% Neat Cement 3% Bentonite Powder mixed with potable water a 7 gallons per 100 lb mixture.

1450 Depart Site 26
1435 Re-Collected 0.5-2.5 at 026-003BH
1500 Drillers decontaminating drill rig & augers
HHP Collected equipment
rinseate blank
(split-spoon samples)

HHP 1515

VOC (0246) (3) 40-ml VOA vials
HCL
SVOC (0270) (1) SVOC under 1L
metals (1) 1L poly HNO₃
Cu (6010)
Pb

Kathy Pritchett

(19)

5/4/95

1525 Arrived at Site 26
Destry Greenway
Kathleen Marino
Kathy Pritchett

~~Started drilling~~
026-001M3BH

1535 Drillers inform us that they need a part for drilling the borehole for the monitor wells

1545 Drillers depart Site 26
1602 Depart Site 26
1710 Arrived at FedEx
1725 Depart FedEx

HP

Kathy Pritchett

(20)

Friday

5/5/95

Weather: cloudy, windy (NW gusty); 40' w/d; wind chill mid 20's to 30's.

645

Arrived at Duluth NWSB Joe Byrd, Jr.
Destiny Greenway
Kathryn Pearce
Kathryn Patelotti
Calibrated PID

700

Serial # stated on page 7 of third field logbook.
Accuracy: 100 ppm
Lot # 41809-42631-24
Environmental Instruments
Calibrated Industrial Scientific Model

715

MX25/ # 9101059-002
Hayco 50.0% LEL
Pentane Lot 41780
Drillers arrived
Arrived at Site 26

740

800

American Engineering Testing
(Joe Tuma
Jonathan Gabriel
Kathryn Patelotti)

(21)

5/5/95

Health & Safety Meeting

815

Optech
Joe Byrd
Kathryn Pearce
Destiny Greenway
Kathryn Patelotti
Joe Tuma
Jonathan Gabriel
American Engineering Testing

820

Started drilling
626 - 001m

823

Collected 0-2'

Boothole

0 ppm
0 LEL 20.7% O₂

BG

0 ppm
0 LEL 20.7% O₂

825

0 ppm
Collected 5'-7'

840

0 ppm
Collected 10'-12'

0 ppm
0 LEL 20.8% O₂

Collected 12-14.5'

0 ppm
0 LEL 20.5-14.5'

Kathryn Pearce

920

5/5/95

900

Collected 15-17'

930

0 ppm
Collected 20-22'

0 ppm

saturated
encountered boulder
~ 16.5' BLS

940

WL ~ 17.2 BLS

948

Decided to set
bottom of screen at
25' BLS TD = 26'

1005

Collected 24-26' BLS

1015

0 ppm
Depart Site 26

1025

Joe Byrd, Jr.
Kathy Pritchett
arrived at headquarters

1105

to discuss schedule

1115

Arrived at Site 26
Started construction

~

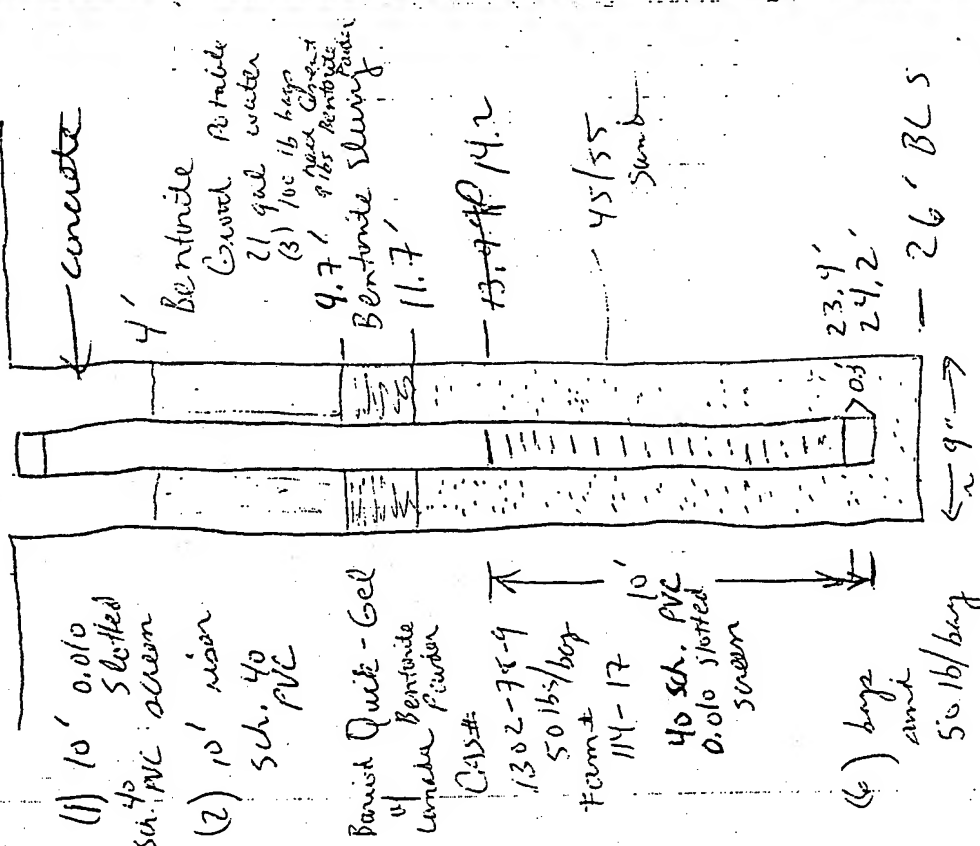
of monitor well
026-001mw
Screened interval 15'-25'

Kathy Pritchett

23

5/5/95

026-001mw



Kathy Pritchett

(24)

1215

1225

Sand at 14.5' BLS

Depart Site 26

for lunch

Deating Greenway

Kathleen Mering

Kathryn Pritchett

Returned to Site 26

Deating Greenway

Kathleen Mering

Kathryn Pritchett

Drillers started again
with installing filter pack.

Drillers finished

grating 026-00/mw

Depart Site 26

Drillers decontaminated

drill rig + augers

by the following procedures:

• steam clean with

Liquinox™ and potable

water; and

• rinse with potable

water

finished decontaminating

drill rig + augers

Kathryn Pritchett

1600

5/5/95

(25)

Mobilized drill

rig on Site 26

Kathryn Pritchett

Jamie Turner

Depart Site 26

Depart Duluth ANCB

Stopped at Target to

purchase supplies

1605

1660

1615

1630

Kathryn Pritchett

(26)

Saturday 5/6/95

Weather: Sunny; 40's;
gentle winds!

645 Arrived at Duluth ANS-B

Joe Byrd, Jr.
Kathleen Merino

Destiny Greenway
Kathryn Pritchett

650 Calibrated P.I.D

Same procedures as

stated on pg 20 of
field logbook

701 Calibrated MX251

same procedures as

stated on pg 20

of field logbook

720 Arrived at Site 26

Joe Byrd, Jr.

Kathleen Merino

Destiny Greenway

Kathryn Pritchett

Drillers arrived at Site 26

Jamie Turner

Randy Wolf

American
Engineering
Testing

Kathryn Pritchett

(27)

5/6/95

Jamie pipe (PVC)
was steam cleaned
yesterday afternoon

B6 O.L.E.L. 20.6% O₂

O₂ ppm

815 Started Hestle & Supt

Meeting Meeting

Jamie Turner

Randy Wolf

Kathleen Merino

Joe Byrd, Jr.

Destiny Greenway

Kathryn Pritchett

Started Drilling

818 Collected 0.3-2.5'

Poor recovery

822 Collected 5-7'

O₂ ppm

831 Photo 026-003m

- hammering split-spun
sample.

Borehole O.L.E.L.

20.7% O₂

O₂ ppm

K - water in canister

Kathryn Pritchett

(26)

5/6/95

837 Re-Collected 0.5-2.5' Poor Recovery

840 W.L. 4.8' BLS

842 W.L. 026-001NW 17.1' BLS Collected 10-12

852 0 ppm

900 W.L. 0 LEL 20.7% O₂ 8.7' BLS

904 Re-Collected 0.5-2.5' need to recover at least 75% for geotechnical sample

910 Collected 15-17' W.L. 11.2' BLS

920 W.L. 6.3' BLS

929 W.L. 6.4' BLS

W.L. 6.3' BLS

950 5' sand in auger

TD Auger at 15' BLS

Note: Schedule PVC screen & wear 40

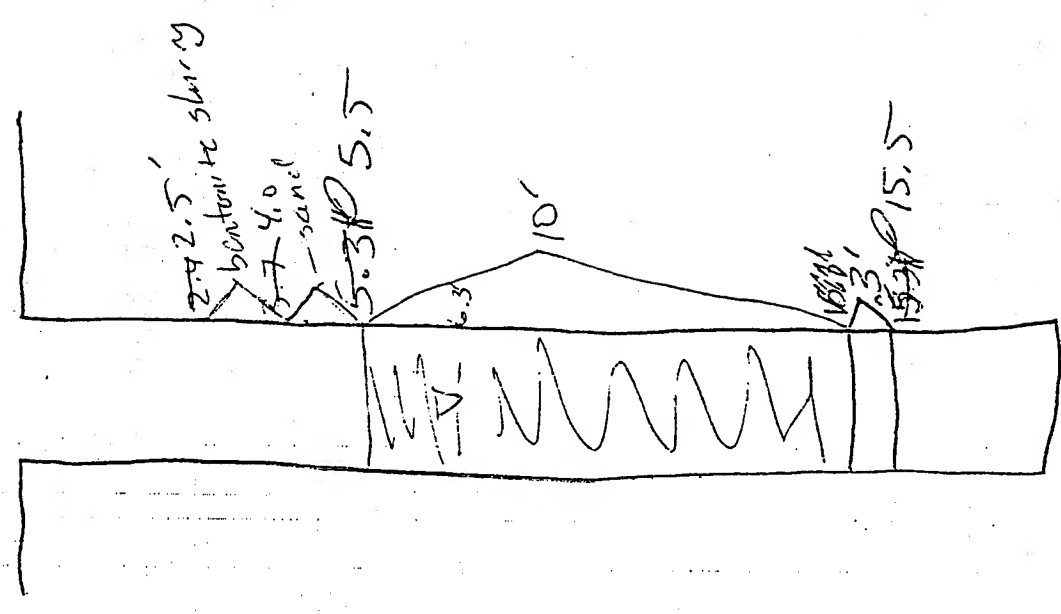
40 pre-cleaned at manufacturer and pre-wrapped.

Screen will be set from 5.5' - 15.5' BLS.

Kathy Pritchett

(29)

5/6/95



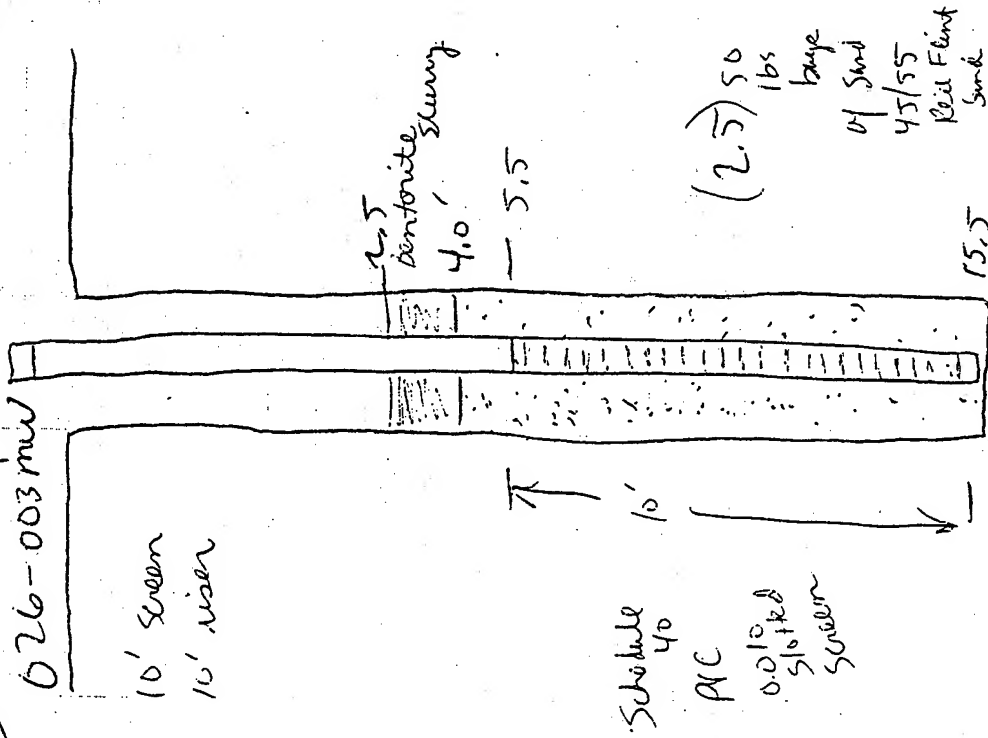
Kathy Pritchett

(30)

5/6/95

026-003 mud

- (1) 10' screen
- (1) 10' riser



1044
1/09 finished construction
depart Site 26 for
decontaminating drill rig
+ auger and tremor pipe
Kathy Pritchett

5/6/95

(31)

by procedures stated
on pg 24 of this field
logbook.
Called Northeast
Technical about pick
up for geotechnical samples
— lab tech. needs to
contact Joe Palo —
need to call back in
15 minutes

Northeast Technical
315 Chestnut St.
Virginia, MN 55742
Attn: Joe Palo
(218) 741-4290
(218) 741-1442
Dorothy Brian Hayden
(218) 724-3114
Drillers finished drilling
decontaminating

Joe Palo
Home

1/4/5

1210

1225

arrived Site 26
Started 026-002 mud
Collected 0.5-2.5'

0 LEL 20.7% O₂
Kathy Pritchett

(32)

5/6/95

1238

Collected 5-7'

0 ppm

Collected 10-12'

0 ppm

1248

W.L. 10.3' BLS

Recollected 0.5-2.5

1255

W.L. 9.4' BLS

1300

W.L. 9.1' BLS

1305

Collected 15-17'

0 ppm

W.L. 14.1' BLS.

1345

W.L. 14.1' BLS

Shut down for day
to wait for water to
rise in borehole

026-002MW

Drillars placed head
on auger

1357

Drillers depart Site 26

Joe Byrd depart
Site 26.

1425

Depart Site 26

Deotry Greenway

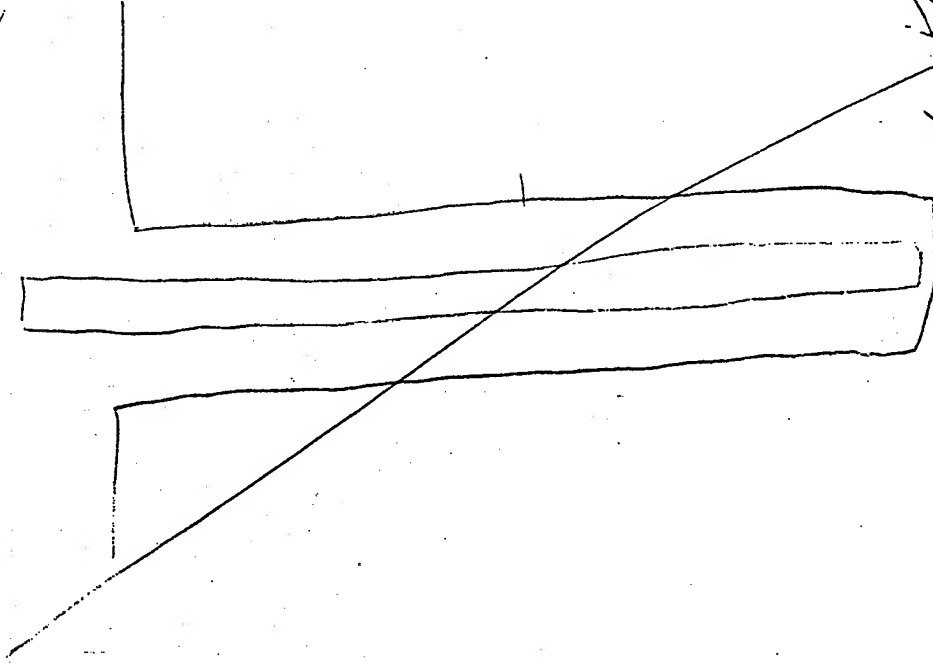
Kathleen Manno

Kathryn Pittsott

Kathryn Pittsott

(33)

5/6/95



Note: Samples collected per geotechnical
Parameters are from 026-002MW-15-17
and 026-002MW-0.5-2.5

1:450 Depart Duluth ANGLS

Joe Byrd, Jr. remain to finish
evening samples.

Kathy Pittsott

84

Monday 5/8/95

Weather: Cloudy; 40's /
gentle wind / NE
Arrived Duluth ANGB

650 Doty Greenway
Kathleen Merino

Joe Byrd, Jr.
Kathryn Pritchett

Joe Byrd, Jr. is
calibrating
4 MX251
PIDS

700

The batteries in the PIDS
were down low - left
pin in (but it was
in sleep mode).
Arrived Site 26
Kathleen Merino
Kathryn Pritchett
Duluth arrived

740

747

750

Jonnie Turner
Jonathan Gabriel
Health & Safety Meeting
Jonnie Turner
Jonathan Gabriel
Kathleen Merino
Kathryn Pritchett

Kathy Pritchett

5/8/95 (35)

755 026- W.L. 13.4'
002mw collected 20-22'
825 BGd 0 LEL 20.8% O₂
Baohole W.L. 11.3' BLS
830 →
840 W.L. 11.3' BLS

850 Started construction of
026-002mw
Screen interval 9-19'
TD 20' BLS

Kathryn Pritchett

(36)

5/8/95

026-002 MW

- (1) 10' 0.01' slotted screen
(2) 10' main

Schedule
46 PNC

Concrete

(7) 50/65/
-4.4' bentonite slurry bags
-6.4' sandy
-9.4' 45/55

Sandy Pack
45/55

-19.4'

TD-20' B.L.S

Finished Construction

Kathy Pinnett

11/30

5/8/95

(37)

Depart Site 26
lunch

11/35

1200-
1300

Called for Site
about shipment of
Hermit for 17 May
delivery. Jeff Davis
is out to lunch -
talked to Steve Amine
Order # 0495225-
Called office to obtain
mastercard # for
Hermit (for Site)
has not taken American
Express)

Matt Alexander - not
in office or John Davis
Called Beth Garry
about Wisconsin CRO/DO
for TPH → OKay with MCA

1305

1315 Per Russ
Lyon

Bunkore Mastercard
5347-1116-0006-6694
Earl E. Parker II 6/196

Kathy Pinnett

(38)

5/8/95

1345

Arrived at Site 26

Kathleen Menno
Kathryn Pittsott

Drillers are finishing
surface completion.

Rain - steady, cold
Depart Site 26

- concrete pads are
complete.

- ground port will be
installed tomorrow and
development should start
tomorrow if weather
permits.

1530 depart Duluth ANGB

Kathryn Pittsott

(39)

Tuesday 5/9/95

Weather: Windy, low 40's,
rain

645 Arrived at Duluth
ANGB

Joe Byrd, Jr.
Destiny Greenway
Kathleen Menno

Kathryn Pittsott

Left Duluth ANGB

Returned Ford Explorer
to exchange for another
(Budget request)

Dillers arrived at

Duluth ANGB

Dillers decontaminated

all-terrain drill rig

as per procedures
stated on page 24 of
this field logbook.

The all-terrain drill
rig will be used for Sites

25, 21 & 17
finished decontaminated

decontaminating

Kathryn Pittsott

(40)

935

Started decontaminating
drill rig (truck + mantle)
before departing Duluth
ANGB as per procedures
stated on page 24 of this
field logbook.

1005

1015

Finished decontaminating
Called Tim Buck
with Twin Port Testing
(218) 722-1911

West on Superior St.

Turn Gayfield ~ 1/4 mile
on left by bridge

5/9/95

Wednesday 5/10/95

(41)

Weather: Cloudy; low 40's
Calm wind; 45% chance of
rain

645 Arrived at Duluth ANGB

Joe Byrd

Dorothy Cheeney

Kathleen Merritt

Kathryn Pissett

650 • Calibrating (Joe Byrd, Jr.)
PIDs as per procedures

stated on page 20 of this

field logbook

• new tips & calibration

gas arrived yesterday

for PIDs.

Calibrated MX251

700

as per procedures stated

on page 20 of this field

logbook.

11.68' B70C

021-009MW

Dillars arrived at

Duluth ANGB

R

Kathryn Pissett

Kathryn Pissett

(42)

810

5/10/95

Health + Safety
meeting - Site 25

James Turner

Jonathan Gabriel

Deputy Greenway
Kathleen Marino

Joe Byrd, Jr.

Kathryn Pittsford

Started Drilling

025 - 001mud

Collected 0.5 - 2.5'

0 ppm

0 LEL 20.5% O₂

Collected 5-7'

0 ppm

Collected 10-12'

0 ppm

Borehole 0 ppm

Drillers stopped to

retrieve shovel at

Site 26

Continued drilling

Fill from 0 - 11' BLS

Collected 15-17'

Kathryn Pittsford

822

825

830

840

915

920

(43)

5/10/95

925

Gary Wint
American Engineering Testing
arrived at Site 25

930

Gary Wint
Joe Byrd, Jr.
to Site 26 to develop

monitor wells at Site 26

932

Collected 15-17'

934

Borehole

0 LEL 20.6% O₂

~ 937

Collected 20-22'

944

0 ppm
collected 25-27'

0 ppm

0 LEL 20.6% O₂

0 ppm

W.L. 23.8' BLS

Sand & Gravel lens

~ 22.5 - 25'

W.L. 23.6' BLS

21.0' Driller (filled) ~ 23.5' BLS

1000

W.L. 23.5' BLS

1023

W.L. 23.2' BLS

41010

Kathryn Pittsford

(49)

5/10/95

1040

collected 30-32

0 ppm

0.2 EL 20.6% O₂

1055

W.L. no water

lens sealed off
with auger

instructed drillers to
collect 35-37'

could have encountered

perched conditions

Collected 35-37'

1104

0 ppm

0.2 EL 20.6% O₂

1112

W.L. 32.4' BLS.

advancing auger

to 46' BLS then

allow to set for

water level to rise

in borehole

~39.8' BLS

auger refusal

W.L. 34.9' BLS.

1130

lunch

Return to Douth AN60

1230

Kathy Pissot

(45)

5/10/95

1231

W.L. 34.7' BLS.

39.8

34.7

5.1

Screen Interval; 29-39' BLS

1235 started construction

of 0.25-0.1 mu

1530 finished construction

1531 Drillers decontaminating

drill rig, auger,

& theme pipe as per

procedure stated on

page 24 of this

field logbook

finish decontaminating

Moved to 0.25-0.02 mu

Collected 0.5-2.5'

1600

1602

1615

B6

0 ppm

0.2 EL 20.6% O₂

Collected 5-7' BLS

0 ppm

Collected 10-12'

0 ppm

Kathy Pissot

(46)

5/10/95

SP 025-001 MW

fluid
mount
surface completion

Bentonite
Cement
3% Bentonite
powder

97% bent
cement
22.5 mixed with
Bentonite slurry
potable
water
27' BLS
(~79%
per 100 lb
of cement)
-29.4'

-39.4'
-39.8' BLS
TD

(1) 10'
D.O.I.O
Screen
PVC
Schedule
40

(3) 10'
riser
PVC
Schedule
40

(6) 50 lb/bag
Sand
45/55

Kathy Pizzotti

(47)

5/10/95

Borehole O L E L 20.6' BLS

Advancing grouters to 15' BLS

1637 Collected 15-17'

1641 0 ppm W.C. 14.3' BLS

allowing water to rise
1645 Drillers depart Site
25' v Duluth ANG-8.

1725 Escorted to near
Bladg. 500 to check
on the Synd. fr. and
Gary Winty on
development
026-001 MW
026-002 MW

1750 Depart Site 26
1800 Depart Duluth
ANGB

Kathy Pizzotti

Thursday 5/11/95

(48)

Weather: Sunny ~45°F high
60's; light NW winds
645 Arrived at Duluth ANGB

for Byrd, Jr.
Desty Greenway
Kathleen Marino

Kathy Pritchett
Calibrated PID
as per procedures stated
on page 20 of this
field logbook.
Calibrated MX251

as per procedure stated
on page 20 of this field
logbook

Dullens arrived
Jamie Tuura
Jonathan Gabriel
Heath & Safety

Meeting
Jamie Tuura
Jonathan Gabriel
Kathleen Marino
Kathy Pritchett
Desty Greenway
for Byrd, Jr.

Kathleen Marino

(49)

5/11/95

025-002mm W.L. 60.0' BLS
021-012PM 7.11' BTDC
stick up ~ 2.1"

~40' North of 025-002mm
TD 16.9' BTDC
021-012PM

025-002mm Screen interval
5-15'

815 TD 7.16' ~~decontamination~~

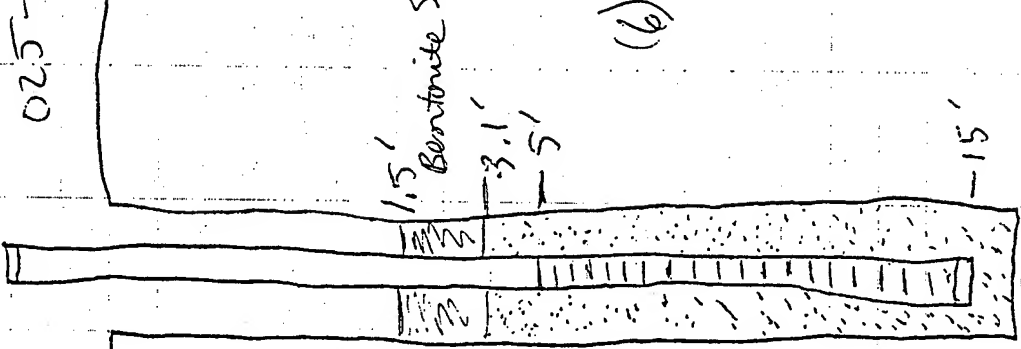
Kathy Pritchett

(50)

5/11/95

025-002mw

- (1) 10' Screen
- (1) 10' riser
- Schedule 40
- PVC



(6) 5016

1039 finished construction

Kathy Pizzol

(51)

5/11/95

Surface completion

fund

1240

1100-

1200

1205

1225

1230

drilled at site 17 to walk over site drilled at Duttle AVIGS. Drillers decontaminating drill rig, augers, & cement pipe as per procedures stated on page 24 of this field logbook.

finished decontaminating

1310

decontaminating

1315

at 025-003mw

BG

OLEL 20.5% O₂

Oppm

moved 025-003mw

due to Soft grounds

→ approved new location

by Bruce Day

1400

SPD collected 0.5-2.5

Oppm

OLEL 20.6% O₂

1400

collected 5' +'

Oppm

OLEL 20.6% O₂

5/11/95

5/11/95

1420

Collected 10-12' BLS

Borehole

0 ppm
0 LEL

20.5% O₂

0.8 ppm split open
collected 15-17'

1428

15 ppm

Peat unit - show
collected 20-22'

0 ppm

Borehole

3.2 ppm

0 LEL 20.5% O₂

1440 W.L.

12.7' BLS

12.5 20.0

8 12.5

20.5 7.5

Screen
drilled TD

10-20' BLS

21' BLS

Borehole

4.7 ppm

0 LEL 20.5% O₂

• Informed drillers of
borehole PID & LEL

readings

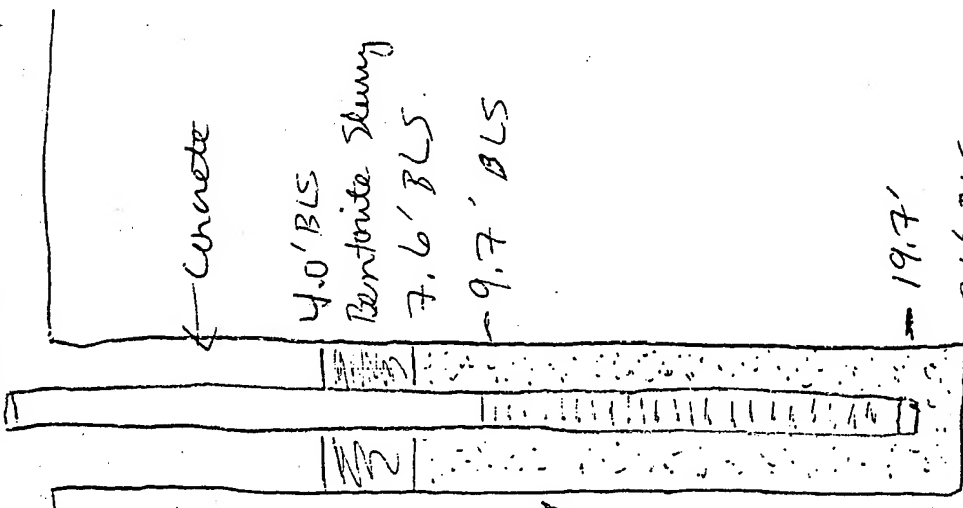
slight fuel odor 40 ppm PID trace
breathing 0 ppm PID trace
good

Kathy Pittcock

5/11/95

53

025-003 MW



- (1) 10' Screen 2.01
- (1) 10' riser Schedule 40 PVC

5.75 50 lb/bag
Sand 45/55

TD 21' BLS

finished construction
Drillers departed
ANCO

Kathy Pittcock

1615
1625

(54)

Borehole PID
1700 Depart

5/11/95

0.3 ppm
Duluth ANGOS

(55)

5/12/95

Weather: Sunny, 60's - high 70's.
slight wind (from the west)
Arrived at Duluth ANGOS
647

Joe Sydnor, Jr.

Kathleen Merino

Destiny Greenway

Kathy Pittslett

To develop
monitor wells

Craig Witty

655 Calibrated PID as

per procedures stated

on page 20 of this

field logbook.

710 Call of Calibrated MX251

as per procedures stated

on page 20 of this

field logbook.

730 Driller arrived

Jamie Taura

Jonathan Gabriel

735

Health & Safety meeting

Jamie Taura

Jonathan Gabriel

Kathleen Merino

Destiny Greenway

Kathy Pittslett

Kathy Pittslett

56

5/17/95

Drillers are engineering
ground port holes at
025-0031W

Drillers are decontaminating
drill rig and
per procedures. started on
page 24 of this field
logbook

finished decontaminating
moved to 025-008BH

Started drilling
Collected 0.5-2.5'

0 ppm
Collected 5-7'
~~0 ppm~~ 0% Recovery

B6

0 LEL 20.6% O₂
Collected 7-9'

2.0 ppm

poor recovery 10%
collected screening
Collected 9-11'

0.5 ppm

0 ppm OLEL
20.6% O₂

Kathy Pritchard

Borehole

935

1000

1005

1015

1025

1030

1035

5/17/95 (57)

1100 Collected 13-15' BLS

0 ppm

1130 moved to 025-001154

1230 returned from lunch

1250 Collected 0.5-2.5'

0 ppm

Borehole 0 ppm OLEL 20.6% O₂

1300 Collected 5-7' BLS

0 ppm

1305 moved to 025-008010BH

1323 Collected 0.5-2.5'

0 ppm

Borehole 0 ppm OLEL 20.5% O₂

1332 Collected 5-7'

0 ppm

Borehole 0 ppm OLEL 20.6% O₂

1340 Recollected 0.5-2.5' BLS

0 ppm

1400 moved to 025-00904

1350 Richard Saxton (mirca)

arrived at Site 26

1415 Collected 0.5-2.5'

Borehole 0 ppm OLEL 20.5% O₂

Kathy Pritchard

58

5/24/95

1423

Collected 5-7' BLS

0 ppm

1432

Collected 10-12' BLS

0 ppm

Backdo 0 ppm 0 LEL 20.6%

Duplicate collected

10-12' BLS

(11-12 - sample) (10-11 dup)

1439

Collected 13-15'

0 ppm

Moved to 025-0063H

1515

Collected 0.5-2.5'

0 ppm

1518

Collected 5-7'

0 ppm

20.6% O₂

1523

Collected 10-12'

0 ppm

1535

Collected 18-20'

0 ppm

0% Recovery

1544

Collected 20-22'

0.7 ppm

Duller's grout soil borings

Kathy Pinnett

5/24/95

59

1625

Collected equipment

minerals 025-001R2

UOL (8240)

(3)

SOX (8270)

(1)

Pb (7421)

(X)

Cd (6010)

Cu (7196)

Ni (6010)

Hg (7470)

1630

Duller's depart Duluth

ANGB

1730

Report Duluth ANGB

for Federal Express

Joe Synd, Jr and

Gary Witty are developing

the first monitor well

0 25-003min

1600 1750

Report Federal Express

KL

Kathy Pinnett

(60)

Monday

5/15/95

Weather ☀️
winds -

Sunny: high 60° -
from NW west, gentle
64° arrived at Duluth ANGB

Joe Byrne, Jr.

Wesley Greenway

Kathleen Wright

Kathy Pintlett

Calibrated PID & MR51

715

62 per procedures

stated on page 20 of
this field logbook.

745

Drillers arrived

Janie Taura

Jonathan Gabriel

815

Drillers decontaminated.

Augura as per procedure

stated on page 24 of
field logbook.

845

Report of Duluth ANGB
to clean Site 17.

Arrived at Site 25

930

940

Moved to 025-003BH

BC

20.6% O₂ O LEL

0 ppm

Kathy Pintlett

5/15/95

(61)

950 Collected 0.5% - 2.5

0 ppm

Borehole

O LEL 20.6% O₂

0 ppm

955 Collected 5-7 - BLS

0 ppm

99000 Collected 10-12: BLS

273 ppm

Borehole

333 ppm

LEL M1251 - low on
batteries

Breathing zone 0 ppm

1008 Left Site 25 to buy
batteries for MR25

1023 Borehole O LEL 20.5% O₂

1030 Collected 15-17' BLS

296 ppm

Borehole

5 LEL 20.5% O₂

1045 Collected 18-20'

2.5 ppm

Borehole 296 ppm

1 LEL

317 ppm 20.5% O₂

5 LEL 20.5% O₂

Kathy Pintlett

(62)

5/15/95

1055 Collected 23-25'
0% Recovery
Borehole 205 ppm
2 LEL 20.5% O₂
290 ppm
6 LEL 20.5% O₂
1110 Re-Collected 25-27' 20-25'
Water encountered ~ 22' BLS
hole collapsed —
24-25' sidewall from
that interval — brecciating
only
TD 25'
lunch

1130-
1225

1230 Moved to 015-002BH
1245 Collected 0.5-2.5'
0 ppm

Borehole 0 ppm
0 LEL 20.5% O₂
Borehole 72 ppm
avg 5' BLS 0 LEL 20.5% O₂
1250 Collected 5-7'
541 ppm
Kathy Pitchford

(63)

5/15/95

Borehole 69 ppm
Breathing zone 0 ppm
1305 Collected 10-12'
330 ppm
Boulder ~ 7.5-8.5'
342 ppm
1312 7 LEL 20.5% O₂
421 290 ppm
12 LEL 20.5% O₂
1315 ~~Shut down~~

1324 drilling
Called Russell Cason
& for Williamson
→ informed of LEL
reading of 12 — per
for Williamson needs to be 10 LEL
in breathing zone
— can stop drilling if
driller feels uncomfortable
unsafe about drilling
Informed driller of
conversation with Optima's
Health & Safety Mgr
(for Williamson) — stating
of low chance of ignition
but ~~not~~ ~~apparent~~ ~~explosion~~ ~~hazard~~
Kathy Pitchford

1345

(64)

5/15/95

due to low oxygen downhole
 — driller (Gunnar Turner) informed
 us that he had experienced
 explosions downhole in the
 past and he felt unsafe
 with drilling deeper. He
 recommended waiting borehole
 before pulling augers to at
 least 10 ft. I recommended
 that the ~~drilling~~ drilling
 should cease with soil
 being 0.25-0.02 BH.

Everyone felt unsafe &
 uneasy about advancing
 the augers.

Drillers' decontaminating
 drill rig and augers as
 per procedures stated on
 page 24 of this field
 logbook.

Finished decontaminating
 moved to 0.25-0.01 BH
 Collected 0.5-2.5'

0 ppm

Kathy Pistlett

1520
 1525
 1530

(65)

5/15/95

Borehole 0 ppm
 1540 0 LEL 20.5% O₂
 augers at 5' 0 ppm
 1541 0 LEL 20.5% O₂
 Collected 5-7'
 742 ppm
 Borehole 33 ppm
 0 LEL 20.5% O₂
 Collected 10-12'

1547 Borehole 250 ppm
 11 LEL 20.5%
 Breathing zone 20 ppm
 1605 Drilled tube benzene
 reads 0 ppm

pumped 15 times & remain
 for 5 mins for conservative
 reading
 TD = 10'
 Shut down drilling on
 this soil being.

— strong petroleum fumes
 — will ghost ASAP.

1630 Borehole after augers have
 been removed — 192 ppm
 over borehole — 25 ppm
 Kathy Pistlett

(66)

1635
1730

ST 15/95

Drillers depart Site 25
Kathleen Marino
and Destiny Greenway
depart Duluth ANGB
for Federal Express
(3) soil samples
& (1) duplicate
(1) Trip blank

Tuesday 5/16/95

(67)

Weather: Cloudy, showers earlier, showers expected this morning (?); 50's; gentle wind - foggy on the hill
645 arrived at Duluth ANGB
Joe Byrd, Jr.
Kathleen Marino
Destiny Greenway
Kathryn Pittsott
Calibrated PID &
MX251 as per
procedure stated on
Pg 20 of this field
logbook
Henrik & Safety

700

745

meeting Destiny Greenway
Kathleen Marino
Kathryn Pittsott
Jamee Tuura
Jonathan Gabriel
Jamee Tuura informed
us that he felt ill
into the night, he felt
fine this morning
Kathy Pittsott

Kathy Pittsott

(68)

5/16/95

Jonathan Gabriel said
that the fumes smelled
nauseated but he felt
fine last night & this
morning.
Everyone else felt
fine.

Try to contact Paul
Wheeler (ANGRC) at
715 in Michigan with
Capt. Wabrowetz - left
message.

Located at 025-007 BH
Collected 0.5-2.5'

815-
817

Borehole 0 ppm
+ BG 0 LEL 20.5% O₂
Collected 5-7'

825

Borehole 0 ppm
0 LEL 20.5% O₂
Collected 10-12'

835

Borehole 0 ppm
0 LEL 20.5%
Kathy Pittsford.

5/16/95 (69)

840 Collected 15-17'
Oppm
Borehole 0 ppm
LEL out - batteries
Died. believe he may
have encountered water
at ~ 14.5' BLS
Collected 20-22'

852 Borehole 0.5 ppm
0 LEL 20.4% O₂
Move to 025-005 BH
Called Russell Cason
(Capted) informed him
Collected 0.5-2.5'

910

903

931

Borehole 0 ppm
0 LEL 20.5% O₂
Collected 5-7'

938

Di Recovery 1.5 ppm 1.5 ppm BG
Borehole 0 ppm
0 LEL 20.4% O₂
Collected 10-12'

950

1.5 ppm BG 1.5 ppm
Borehole 0 ppm
0 LEL 20.4% O₂
Kathy Pittsford

20

5/16/95

- much advancing to the surface ~ 15' BLS
→ may be perched water (?)

1000

Borehole

collected 18-20'

0% Recovery

0 ppm

OLEL 20.4% O₂

collected 20-22'

0 ppm

1345

Borehole

0 ppm OLEL

20.5% O₂

Dillers decontaminating

surface as per procedures stated on page 24 of field logbook.

moved to 36.5-004BH

collected 0.5-2.5'

0 ppm

collected 5-7'

0 ppm

collected 10-12'

0 ppm

Borehole

0 ppm

OLEL 20.4% O₂

Kathy Pitts

71

5/16/95

Borehole 0 ppm

OLEL 20.4% O₂

collected 18-20' BLS

1150

0 ppm

Borehole

0 ppm

OLEL 20.4% O₂

moved 021-026BH

collected 0.5-2.5'

9.1 ppm

collected 4-6'

2.8 ppm

collected 8-10'

1405

Borehole

0 ppm

OLEL 20.5% O₂

Recollecting 0.5-2.5'

0 ppm

moved to 021-027BH

collected 0.5-2.5'

1425

1438

Borehole

0 ppm

OLEL 20.5% O₂

collected 4-6' oppm

0 ppm

OLEL 20.5% O₂

Kathy Pitts

1448

Borehole

(72)

1458

5/16/95

collected 8-10' o.s.s.

0 ppm

duplicate collected

Moved 021-028BH

collected 0.5-2.5'

0 ppm

collected 4-6'

0 ppm

water encountered

called Paul Wheeler

(ANGRC) to discuss

an additional soil boring

west of MORGs area

— yes → just

drill 20' ~~ft~~ less at

Site 17 for adjustment

of cost.

Drillers

boreholes

as per work

Plan

arrived at Federal

express

equipment invoice

(4) soil samples

4530735790

(4) soil samples

Kathy Pitts

airbill #

1700

1610

1545

1538

1515

1522

1545

1538

1515

1522

1545

1538

1515

1522

1545

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1545

1538

1515

1522

(74)

Wednesday 5/17/95

Weather: Sunny cool -
high 50's; low 40's; wind chill
~30°F; windy; NW
10-15 mph

645 Arrived at Duluth ANG
arrived at 600
Denny Greenway
Kathleen Marino

for Byrd, Jr.
Kathryn Fitzhott
Calibrated PID &

700

MX251 as per procedures
stated on page 20 of
this field logbook.

730

Dillers arrived
Jonnie Turner
Jonathan Gabriel

745

Dillers decontaminating
suits as per procedures
stated on page 24 of this
field logbook.

820

Finished decontaminating
Platt & Safety meeting
Jonnie Turner
Jonathan Gabriel

(75)

5/17/95

Denny Greenway
Kathleen Marino
Kathryn Fitzhott
Moved to 025-0128H
(north of mesa area)
Collected 0.5-2.5'

830

838

0 ppm
Collected 5-7'
9.6 ppm

843

Boothole
at BG

0 ppm
0 LEL 20.5% O₂
Collected 10-12'
7.5 ppm

850

Boothole

8.5 ppm before
0 ppm after sample
0 LEL 20.5% O₂
Collected 15-20'
4.5 ppm

900

Boothole

3.5 ppm
2 LEL 20.5% O₂
919 (west
of BG) Moved to 025-0128H
926 Collected 0.5-2.5'
0 ppm

Boothole

0 ppm
0 LEL 20.5% O₂
Kathryn Fitzhott

(76)

5/17/95

935

Collected 5-7'

Borehole

0 ppm
0 ppm

OLEL 20.5% On

1004

Collected 10-12'

Borehole

0 ppm
0 ppm

OLEL 20.4% On

1015

Collected 16-20'

Borehole

0 ppm
0 ppm

OLEL 20.5% On

1100

Dillers decontaminating

drilling augers as

per procedures stated on

page 24 of this field

logbook

1020-

1100

Dillers quitted boreholes

Setting up at Site 17

1100-

1130

1145

Dillers left Duvitch Area

to mobilize to Site 17

Kathy Patchett

(77)

5/17/95

1315

017-024 BH

Collected 0.5-2.5'

1330

0 ppm

1337

Collected 4-6'

0 ppm

Borehole

0 ppm

4 BG OLEL/ppm 20.5% O₂

Peat silt 0-6.5'

6.5-10'

Silt w/ water and

Moved to 017-025 BH

1350

Collected 0.5-2.5'

1400

0 ppm

Collected 4-6' Peat

Water encountered

1405

0 ppm

Borehole

0 ppm

OLEL 20.5% O₂

1415

Moved to 017-022 BH

1420

Collected 0.5-2.5'

1430

0 ppm

Collected 4-6'

Water at 3.5'

20% Recovery

Borehole

0 ppm

OLEL 20.5% O₂

Kathy Patchett

(48)

5/17/95

017-023 BH

1445

Moved to 024BH

1458

Collected 0.5-2.5'

0 ppm

1507

Collected 4-6'

0 ppm

Water encountered at ~4'

BLW

1520

Moved to 017-028BH

1535

Collected 0.5-2.5'

0 ppm

1544

Collected 4-6'

water encountered 0 ppm

note: It was a prairie-willow day at Site 17

1600

Collected effluent
in seepage - split open
Site 17

WDNR

3) 40-ml ~~top~~ HCL

620/DEO

300C (8270) 1) 1L anten

Hg (7440) 1) 1L Poly HNO₃

6445 meet Lake Superior Lab

at Duluth ANG's

WDNR

19) Soil Samples

G-RD/DEO

Equipment Permit

Kathy Pittsford

(79)

5/17/95

Arrived at Federal

Express

Arrived at Site 17 to

load supplies

Depart Duluth ANG's

1715

1745

1830

18

Kathy Pittsford

(80)

Thursday 5/18/95

Weather: Sunny; 60°
645 Arrived at Duluth
ANCB

Joe Byrd, Jr.
Desty Greenway
Kathleen Marino
Kathryn Pittblott

PID were calibrated

by Joe Byrd, Jr.
as per procedures stated
on page 20 of this

field logbook

Called (Kathleen)

Lake Superior Lab-

(Tim Buck) to confirm

obtaining

results for soil

samples delivered

Tuesday + Wednesday -

stated that these were

a 24-hour turnaround

called Russell Croon

about the above -

off he will inform
Mark Enos (Optek)

Kathryn Pittblott

5/18/95 (81)

arrived at 025-001m

Kathleen Marino

Kathryn Pittblott

Joe Byrd, Jr. ad

Desty Greenway

at Site 26 collecting

groundwater samples

1018

PID 02.640 ppm

W.L. = 22.91' BTOC = 20

TD = 39.81' BTOC = 20

Transducer 17.10

1146

Start slug test

- injection at 025-001m

1240

stopped test

~~1244~~

Started withdrawal

1242

test at 025-001m

1337

stopped test

1345

Stopped to cool down

- been in sun too

long.

1515

025-003m

53.0 ppm

W.L. 40.0' BTOC

TD: 22.00' BTOC

Kathryn Pittblott

(82)

5/18/95

1531

11:05 / Tamadua

Static

1534

Start injection

1638

test - 625-03ms

1646

stopped test

started

withdraw

1800

stopped test

1845

Depart Duluth

ANGB

(83)

Friday 5/19/95

Weather: Sunny; 50-60°

Light winds

645

Arrived at Duluth ANGB

Debra Greenway

Kathleen Marino

Joe Boyd / Dr.

Kathy Pritchett

715

Calibrated PIDs &

MX251 as per procedure

stated on page 20 of this

field logbook

825

Called KREM -

will meet them at

870

1530 at Site 25

Pullen arrived with

835

drill rig

Health & Safety meeting

Debra Greenway

Kathleen Marino

Jaymie Turner

Jonghan Goprial

Kathy Pritchett

844

Moved to 0176-05104

853

collected 0.5-2.5

25% recovery

Kathy Pritchett

Kathy Pritchett

(84)

5/19/95

858 Collected 4-6' BG
water encountered 0 ppm
Recollected 0.5-2.5'
25% Recovery
0 ppm

910 Recollected 0.5-2.5'

915 moved to 017-021 BH
920 Collected 0.5-2.5'

925 0 ppm
collected 4-6'

935 water encountered 0 ppm
942 Moved to 017-032 BH
Collected 0.5-2.5'

957 water encountered
1004 moved to 017-030 BH
Collected 0.5-2.5'

1010 0 ppm water encountered
Collected 4-6' KD

1020 Duplicate collected for
TPH GRO/DEO
Moved 017-029 BH

Kathy Pittsford

(85)

5/19/95

1027 Collected 0.5-2.5'
water encountered 45% Recovery
1035 Recollected 0.5-2.5'

0 ppm
Duplicate collected
for SWC, 14y (SPL)
& TPH (Lake Superior)

1040- Drillers grout
1110 drill pouring with
3% bentonite powder &
97% neat cement

1130-1230 Lunch
1240 Collected equipment
insecticide - split

WDNR GRO/DEO (3) 40-ml vial HCL
SPX (8270) (1) 1 L amber
H₂ (7470) (1) 1 L Poly HNO₃

1330 Meet Lake Superior Lake
at Duluth ANCO Gate
to relinquish:

- (7) 50:1 Surplex
 - (2) Duplicate
 - (1) MSD/msd
 - (1) Equipment Rinsewater - split apor
- Kathy Pittsford

(86)

5/19/95

1340

Arrived at 025-002mw
to slug test

W.L. 7.32' B70C'
T.D. 17.45' B70C'

1400

Started injection test
at 025-002mw

~1450
1505

Stopped test
Started withdraw
test

1530

Bill Anderson with
RREM arrived at

Site 25 to work over

Sites 25, 21, 26 & 17-

1630

for surveying
Return to Duluth ANG B
to pack samples

1730

Depart Duluth ANG B

1815

for Federal express
Return to Duluth
ANG B

1830

Report Duluth ANG B

1840

Dropped Kathleen ~~from~~
Merino at the airport

~~Kathy Pritchett~~

Saturday

5/20/95 (87)

Weather: Sunny 70-56°
Wind from the west - cool.
☺

645 arrived at Duluth ANG B

Destiny Greenway

Joe Byrd Jr.

Kathryn Pritchett

arrived at Site 26

Destiny Greenway

Kathryn Pritchett

to slug test monitor

Wells

026-001mw

W.L. 17.03' B70C

T.D. 25.28' B70C

Started SP injection
test at 026-001mw

~814

Stopped test

Started withdraw

test

833

835

Stopped test

Moved to 026-003mw

W.L. 7.36' B70C

T.D. 17.92' B70C

Kathy Pritchett

(88) 935

434

1007

1009

1049

1125

1145-1230

1245

5/20/95

Started injection
test at 026-003 MW

Stopped test

Started withdraw

test

Stopped test

Depart Site 26

Unich

Arrived at Site 26

Destry Greenway

Kathryn Pittsott

Joe Byrd, Jr. at

body 247 running

water samples on GC

Moved to 026-002 MW

W.L. 9.50'

T.D. 21.40'

Started injection test

at 026-002 MW

Stopped test

Started withdraw test

Stopped test

Depart Site 26

Arrived at Federal

Express

Kathryn Pittsott

(89)

5/20/95

Arrived at Duluth

ANCOB -

check site 25 -

wanted drums -

id to hold off until

analytical results

Depart Duluth

ANCOB

1640

1730

Kathryn Pittsott

Du/uth ANG 1315-197

①

Decon Procedure

1. Wash with mix of potable water and Liqinox. Scrub with brush
2. Rinse with potable water
3. Rinse with deionized water
4. Allow to air dry completely
5. Wrap with aluminum foil (shiny side out.)

No further entries
Desty Greeny

CONTENTS

REFERENCE

1 Decon procedure

DATE

②

Friday 4-28-95

16:15 Pre-mob meeting for Duluth ANG
17:30 Meeting over

No further entries
Deety Dreaming

③

Monday ^{8:00} 5-1-95

04:30 Depart for Duluth
14:40 Arrive in Duluth
14:50 Begin unloading equip., etc.
15:25 Begin staking locations for site
25.
16:20 Leave base
17:00 Arrive at motel to check in.

No further entries
Deety Dreaming

④

Tuesday 5-2-95

07:15 Leave motel
 08:00 Breakfast meeting
 08:40 Arrive at base
 09:20 Called Fedex to track packages
 09:30 Prepare stakes for Site 26 & Site 17.
 10:20 Head to Site 26 to stake BH's.
 11:10 Site 26 completed
 12:30 Return from lunch. Unload GC stuff
 13:25 Go to store to get supplies
 14:50 Return from store
 15:10 Begin helping Joe with GC set-up and cutting squares (Teflon & foil)
 16:20 Put visqueen on sample table & decon table
 16:50 Leave base

No further entries
 Datz Creamy

⑤

Wednesday 5-3-95

05:50 Leave motel
 06:40 Depart breakfast
 06:45 Arrive at base. Load equip. for moving to Site 26.
 07:25 Calibrated PIDs. to 100 PPM
 10:30 Break for lunch
 11:20 Return from lunch
 11:45 Arrive at Site 26. Set up decon.
 12:15 Health and Safety meeting with drillers and Optech team.
 12:25 Begin decon 026-006BH
 13:35 026-006BH completed
 13:40 Begin decon 026-005BH
 14:15 026-005BH completed
 16:20 Leave Site 26. Go to bldg 247 to prepare for samples.
 17:35 Leave base

No further entries
 Datz Creamy

⑥

Thursday 5-4-95

0550

Leave motel

0640

Depart breakfast

0650

Arrive at base. Load equip. to return to Site 26.

0800

Go to fire dept.

0810

Return from fire dept.

0815

Drillers deconning equip. (start)

Decon procedure is as follows:

1. Steam clean with mix of

potable water and Ligninox

2. Steam ~~clean~~ ^{rinse} with potable

water

3. Augers wrapped in visqueen

Decon of augers complete

Arrive at Site 26

Health and Safety meeting with

drillers and Optech crew.

Set up decon and sample prep

tables.

Begin decon (procedure explained

on page 1.) on Site 26

Break for lunch

Return from lunch

0835

0850

0855

0900

0910

1205

1330

⑦

Thursday 5-4-95 (continued)

Take pictures of grouting by

drillers.

Resume decon at Site 26

Leave Site 26

Equip. blank

Return to Site 26

Leave Site 26

Return to bldg 247. Unload

equip. Prepare for next day.

Leave base

1350

1435

1445

1515

1520

1555

1600

18:30

No further entries
Dusty Drummy

⑧

Friday 5-5-95

0550
0640
0650

Leave motel
Depart breakfast
Arrive at base. Begin to load ~~unload~~ equip.

0800
0810

Arrive at Site 26. Set up decon.
Health & Safety meeting with
drillers & Optech crew.

0820
1015
1215
1330

Begin decon (see p. 1)
Decon complete
Leave Base for lunch
Return from lunch. Observe
drillers completing well.

1530^{DM}
1550
1615

Leave Site 26
Leave base

No further entries
Deetz Greeny

⑨

Saturday 5-6-95

0550
0640
0645

Leave motel
Depart breakfast
Arrive at base. Load equip.
for the day

0720
0805
0805^{DM}

Arrive at site 26. Set up decon.
Health and Safety meeting
with drillers and Optech crew.

0810
0935

Begin decon. (See pg. 1)
Decon complete. Observe drillers
completing well.

1110
1200

Break for lunch
Return from lunch

1215
1345

Arrive at Site 26. Begin decon
Decon complete

1425
1440

Leave Site 26
Leave base

No further entries
Deetz Greeny

(10)

Monday 5-8-95

0555 Leave base
 0640 Depart break fast
 0650 Arrive at base
 0720 Set up and take count of sample kits.
 0830 Programmed GC & built all 3 standards under supervision of Joe Byrd-GC operator
 Gain 1000
 Carrier Gas Flow 14 mL/min
 Injection vol. 100 μ L ~~100~~
 GC Oven temp. 400 C
 Analysis time 400 sec.
 0954 100 PPB BTEx standard -
 1010 Missed shot
 1029 100 PPB BTEx standard
 Good run. Set library
 1045 1 PPM BTEx standard
 Good run. Set library
 1059 10 PPM BTEx standard
 Good run. Set library
 Air blank *

(11)

Monday 5-8-95

* Benzene 12 ppb
 * Toluene 30 ppb
 * Ethylbenzene 79 ppb
 * m,p-xylene 155 ppb
 * o-xylene 76 ppb
 unusually high values. Shoot air blank again
 1113 Air blank
 * Benzene 5 ppb
 * Toluene 16 ppb
 * Ethylbenzene 41 ppb
 * m,p-xylene 92 ppb
 * o-xylene 185 ppb
 1124 Printer malfunction. Need to reprint
 1135 Break for lunch
 1240 Return from lunch
 * 026-002 MW 20'-22' 10 g.
 * Benzene 4 ppb
 * Toluene 6 ppb
 * Ethylbenzene 7 ppb
 * m,p-xylene 13 ppb
 * o-xylene 11 ppb

1307 100 ppb BTEX Standard

	cal	
Benzene	99	ppb
Toluene	80	ppb
Ethylbenzene	72	ppb
m,p-xylene	133	ppb
o-xylene	47	ppb

1319 Shut down GC.

Shut down GC.
Return to decon brass sleeves
at bldg. 247 (See pg. 11)
Decon complete. Wrap tables for
next day.

1530 Leave base

~~No further entries
Desty Dreamy~~

Tuesday 5-9-95

0605 Leave motel
0700 Depart breakfast
0705 Arrive at base. Wrap brass sleeves
Recharge P.D.s.
0740 Leave base. No work due to
very rainy weather.

~~No further entries
Desty Dreamy~~

③

~~No further entries
Desty Dreamy~~

(17)

Wednesday 5-10-95

10555 Leave motel
 10640 Depart breakfast
 10645 Arrive at base. Set up decon, get ready for drilling at Site 25.
 10740 Begin decon (see pg. 1)
 10810 Health and Safety meeting with drillers and Optech crew.
 0815 Resume decon
 1130 Decon complete. Break for lunch
 1230 Return from lunch. Observe drillers completing well. Move decon equip. to next well.
 1420 Begin decon
 1700 Decon complete. Check on Joe at Site 26.
 1755 Leave base

No further entries
 Deth, Greany

(15)

Thursday 5-11-95

0550 Leave motel
 0640 Depart breakfast
 0645 Arrive at base. Set up decon. prepare for day's drilling.
 0740 Health and Safety meeting with drillers and Optech crew.
 0815 Copy log forms and field notebooks
 0900 Copying complete. Observe Joe and GC work.
 1100 Break for lunch
 1205 Arrive at Site 17 to check stakes
 1225 Arrive at base. Prepare for 225-003 MW.
 1400 Begin decon (see pg. 1)
 1505 Decon complete. Break down everything.
 1650 Leave base

No further entries
 Deth, Greany

(16)

Friday 5-12-95

0550 Leave motel
 0640 Depart breakfast
 0650 Arrive at base. Calibrate Hydacs
 and turbidity meters.
 0710 ~~Call base~~ Set up decon.
 0725 Health and Safety meeting with
 drillers and Optech crew.
 1015 Begin decon (see pg. 1) on Site 25
 boreholes
 1130 Break for lunch
 1240 Return from lunch. Begin decon.
 1600 Decon complete. Break down equip.
 Prepare for Monday.
 1725 Leave base
 1730 Arrive at Fedex
 1740 Leave Fedex

No further entries
 Duty Drury

(17)

Monday 5-15-95

0550 Leave motel
 0640 Depart breakfast
 0645 Arrive at base. Set up decon, other
 equip.
 0800 Begin decon (see pg. 1)
 0930 Health and Safety meeting
 0935 Resume decon
 1130 Break for lunch
 1220 Return from lunch. Resume decon
 1225 Go to store to get supplies.
 1300 Return to base. Resume decon
 1430 Decon complete. 025-002BH
 was discontinued because of
 LEL alarm after conferring with
 drillers.
 1520 Resume decon
 1655 Decon complete. Break down
 equip.
 1735 Leave base
 1740 Arrive at Fedex
 1750 Leave Fedex

No further entries
 Duty Drury

(18)

Tuesday 5-16-95

0550 Leave motel
0640 Depart breakfast
0645 Arrive at base. Set up decon. Prepare
for day.
0745 Health and Safety meeting with
drillers and Optech crew.
0810 Begin decon (see pg. 1)
1200 Decon complete. Break for lunch
1320 Return from lunch. Resume decon
1605 Decon complete. Break down
equip.
1740 Leave base

No further entries
Dusty Drummy

(19)

Wednesday 5-17-95

0555 Leave motel
0620 Arrive at base
0730 Begin decon (see pg. 1)
0825 Health and Safety meeting
0920 Decon complete. Break down
equip.
1055 Leave Site 25
1115 Arrive at Site 17. Set up equip.
for sampling.
1155 Break for lunch
1310 Return from lunch
1325 Begin decon
1705 Decon complete. Pack up equip.
1800 Leave Site 17
1810 Arrive at Base
1825 Leave base

No further entries
Dusty Drummy

(20)

Thursday 5-18-95

0550 Leave motel
0650 Depart break fast
0655 Arrive at ~~break~~ fast base. Load
equip. for sampling wells.
0715 Calibrated Hydracs
0755 Arrive at Site 26
0800 Decon bailers and H₂O level
level meter.
0840 Set up at well H026-001MW
0845 Begin purging
0935 Purging completed.
0953 Field blank taken. see
Rinsate blank taken
11015 026-001MW sampling begins
11020 Sampling complete. Decon bailer
11040 Arrive at ~~base~~ and set up at
026-002MW.
11045 Begin purging.
1125 Purging completed
1130 Begin sampling
1140 Sampling completed. Decon bailer
11205 Arrive and set up ^{base} at 026-003MW
Begin purging.

(21)

1215 Rinsate blank taken
1225 Begin purging
1310 Purging completed.
1335 Begin sampling
1355 Sampling completed.
1410 Leave Site 26.
1430 Set up decon at Bldg 247.
1440 Begin decon
1449 Decon complete
1500 Break for lunch
1515 Lunch over
1520 Arrive at Site 25. Set up
for 025-002MW
1525 Begin Purging
1628 Purging completed
1700 Begin Sampling
1710 Sampling completed. Break
down equip.
1725 Leave base
1730 Arrive at Fedex
1750 Leave Fedex
1800 Arrive back at base
1825 Leave base

No further entries
see Every

(22)

Friday 5-19-95

- 0555 Leave motel
0640 Depart breakfast
0645 Arrive at base. Load equip. for site 17.
0725 Arrive at Site 17. Set up equip.
0830 Health and Safety meeting with drillers and Optech crew.
0850 Begin decon (see pg. 1)
1045 Decon complete. Break down equip.
1130 Break ~~down~~ for lunch
1230 Return from lunch
1345 Take rinsate blank
1310 Arrive at 025-001MW. Set up equip.
1315 Begin purging
1420 Purging completed.
1425 Take potable water field blank while waiting for 025-001MW to recharge.
1520 Sampling complete
1530 Take rinsate blank.
1550 Arrive at 025-003MW to set up.
1555 Begin purging

(23)

- 1635 ~~Done~~ purging completed. Waiting for recharge
1705 Sampling begins
1730 Sampling complete. Move GC equip.
1835 Leave base.

No further entries
Dusty Dreaming

(24)

Saturday 5-20-95

0555 Leave motel
0645 Depart breakfast
0655 Arrive at base. Load truck for
slug testing
0730 Arrive at 026-001 MW. Set
up equip. to slug test.
0910 Arrive at 026-003 MW. Set
up equip. to slug test.
1120 Left Site 26.
1145 Lunch break
1230 Lunch over
1255 Arrive at Site 26. Arrive at
026-002 MW. Set up equip.
to slug test.
1415 Leave Site 26.
1420 Arrive at Bldg 247 to
pack up to leave Duluth.
1605 Leave base to go to FedEx.
1620 Arrive at FedEx
1635 Depart FedEx
1640 Arrive at Base. Marked
drums.
1725 Leave base

No further entries
Duty Ending

ITEMS

ITEM	QTY	UNIT	PRICE	TOTAL
1000	1	EA	1.00	1.00
2000	1	EA	2.00	2.00
3000	1	EA	3.00	3.00
4000	1	EA	4.00	4.00
5000	1	EA	5.00	5.00
6000	1	EA	6.00	6.00
7000	1	EA	7.00	7.00
8000	1	EA	8.00	8.00
9000	1	EA	9.00	9.00
10000	1	EA	10.00	10.00

WEIGHT

WEIGHT	QTY	UNIT	PRICE	TOTAL
1000	1	EA	1.00	1.00
2000	1	EA	2.00	2.00
3000	1	EA	3.00	3.00
4000	1	EA	4.00	4.00
5000	1	EA	5.00	5.00
6000	1	EA	6.00	6.00
7000	1	EA	7.00	7.00
8000	1	EA	8.00	8.00
9000	1	EA	9.00	9.00
10000	1	EA	10.00	10.00

VOLUME

VOLUME	QTY	UNIT	PRICE	TOTAL
1000	1	EA	1.00	1.00
2000	1	EA	2.00	2.00
3000	1	EA	3.00	3.00
4000	1	EA	4.00	4.00
5000	1	EA	5.00	5.00
6000	1	EA	6.00	6.00
7000	1	EA	7.00	7.00
8000	1	EA	8.00	8.00
9000	1	EA	9.00	9.00
10000	1	EA	10.00	10.00

PERCENTAGE

PERCENTAGE	QTY	UNIT	PRICE	TOTAL
1000	1	EA	1.00	1.00
2000	1	EA	2.00	2.00
3000	1	EA	3.00	3.00
4000	1	EA	4.00	4.00
5000	1	EA	5.00	5.00
6000	1	EA	6.00	6.00
7000	1	EA	7.00	7.00
8000	1	EA	8.00	8.00
9000	1	EA	9.00	9.00
10000	1	EA	10.00	10.00

Notes

Notes	QTY	UNIT	PRICE	TOTAL
1000	1	EA	1.00	1.00
2000	1	EA	2.00	2.00
3000	1	EA	3.00	3.00
4000	1	EA	4.00	4.00
5000	1	EA	5.00	5.00
6000	1	EA	6.00	6.00
7000	1	EA	7.00	7.00
8000	1	EA	8.00	8.00
9000	1	EA	9.00	9.00
10000	1	EA	10.00	10.00

Summary

Summary	QTY	UNIT	PRICE	TOTAL
1000	1	EA	1.00	1.00
2000	1	EA	2.00	2.00
3000	1	EA	3.00	3.00
4000	1	EA	4.00	4.00
5000	1	EA	5.00	5.00
6000	1	EA	6.00	6.00
7000	1	EA	7.00	7.00
8000	1	EA	8.00	8.00
9000	1	EA	9.00	9.00
10000	1	EA	10.00	10.00

Grand Total

Grand Total	QTY	UNIT	PRICE	TOTAL
1000	1	EA	1.00	1.00
2000	1	EA	2.00	2.00
3000	1	EA	3.00	3.00
4000	1	EA	4.00	4.00
5000	1	EA	5.00	5.00
6000	1	EA	6.00	6.00
7000	1	EA	7.00	7.00
8000	1	EA	8.00	8.00
9000	1	EA	9.00	9.00
10000	1	EA	10.00	10.00

Comments

Comments	QTY	UNIT	PRICE	TOTAL
1000	1	EA	1.00	1.00
2000	1	EA	2.00	2.00
3000	1	EA	3.00	3.00
4000	1	EA	4.00	4.00
5000	1	EA	5.00	5.00
6000	1	EA	6.00	6.00
7000	1	EA	7.00	7.00
8000	1	EA	8.00	8.00
9000	1	EA	9.00	9.00
10000	1	EA	10.00	10.00

A. Kathleen Merino (K.M.)
 #100 NW Loop 410, Ste 230
 San Antonio, TX 78229
 (210) 731-0000 1-800-677-8072
 Duluth SI Sites 26, 25
 Radisson Hotel (218) 727-8781

CONTENTS

REF ID: A DATE

K.M. Kathleen Herino
 K.P. Kathryn Pritthead
 D.G. Destiny Greenway
 J.B. Joe Byrd

1 May 95

0515 Depart for SA Airport

0620 Flight departs for Duluth, MN

~~1245~~ 1245 Arrived at Duluth Airport

1315-1400 LUNCH

1400 Arrived at Base met w/ Bruce Berg

1430 Met with base security - Capt Kovach

1515-1615 Staked locations at Site 25

1630 Left base

END OF DAY

A. Herino

2

2 May 95

3

0700 Met Hotel Lobby

0715-0830 Breakfast and

Planning meeting
for days events
Organized supplies
and stake site 26
locations

0845-1115

1130-1230 LUNCH

1203-1315

K.M. organized
it inventoried
sample bottles
from lab.

1315-1525

Prepared labels
for samples

1525-1630

Staked locations
at site 17 and
returned to
base.

1645

Left base.
END OF DAY

[Signature]

3 May 95

0545 Met in hotel lobby and
departed for breakfast

0600 - Breakfast and

0645 planning meeting

for day.

0700 Prepared supplies for

drilling.

0800 Drillers arrive and

-0930

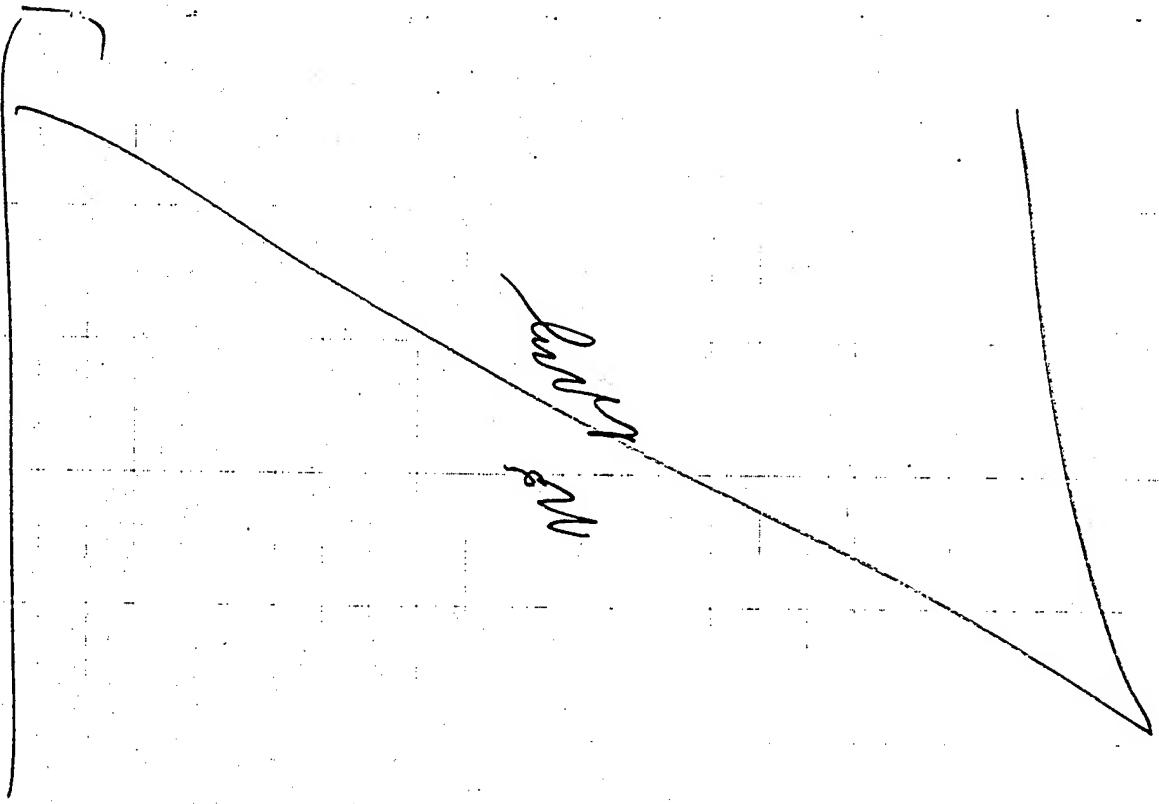
begin decon angers
etc. at area south of
hill (at site 25).

Decon was accomplished
by preparing site with
pallets w/ plastic on top
and bottom and placing
anger flights on top of
plastic covered pallets.
Water source was
tank on truck with
water from the City
of Duluth. Water (steamer)

was clear from truck
tank. Truck & driller
rig decon w/ steamer

A. R. R. R.

6



M. L. M.

3 MAR 95

7

0930- Driller's rinse truck, auger
0955 w/ ligninox soap.

1030-1120 LUNCH
1130 Prepared site 26 for
soil boring drilling
1215 Site Safety Meeting
1230 Began drilling
026-006 BH

7/9/9/7 0.5-2.5 BLS 4cm
1245 sample @ 2.0-2.5 1245

11/3/19/10 S-7 BLS
1300 sample @ 5.5-7

12/14/17/21 870 BLS
sample @ not collected
no recovery

9/15/20/21 10-12 BLS
sample @ 11.5-12 1320

TD = 12' BLS

A. K. M.

3 MAY 95

1335 Moved to [026-005BH]
 1340 drove 1st spoon 0.5-2.5'

~~3441115~~ 5-7' am 0.5-2.5 BLS
 1345 sample @ 2.0-2.5 (1.5-2.5)*
 1348 dup sample @ 1.5-2 (1.5-1.5)*

* lab designation
 1356 6.5-7 sample @ collector
 for lab

1400 9.5-10 sample collected
 for lab

TD = 10' BLS

1420 Moved to [026-004AH]
 1432 sample @ 2.0-2.5 BLS

poor recovery at 5-7 BLS
 sample @ 7.5-10 BLS

Auger 2 1/2 ID
 Borehole diameter 6"
 Geologist: Kathleen Merino

1535 ~~026-001BH~~
 sample @ 9.5-10.0
 sample @ 7.0-9.5 m/si

A. Merino

*No cutting
 N. Merino*

[Large handwritten scribble]

3 MAY 95

11

1540 second hole at 026-001 BH
 sample @ 2.0-2.5 BLS
 1545 second hole at 026-001 BH
 sample @ 6.5-7.0 BLS
 1550 Beam cleaning up site
 1650 collected cleanup sample
 blank @
 1655 Prepare COC and organize
 samples
 1800 Dropped sampler at
 at feed = X

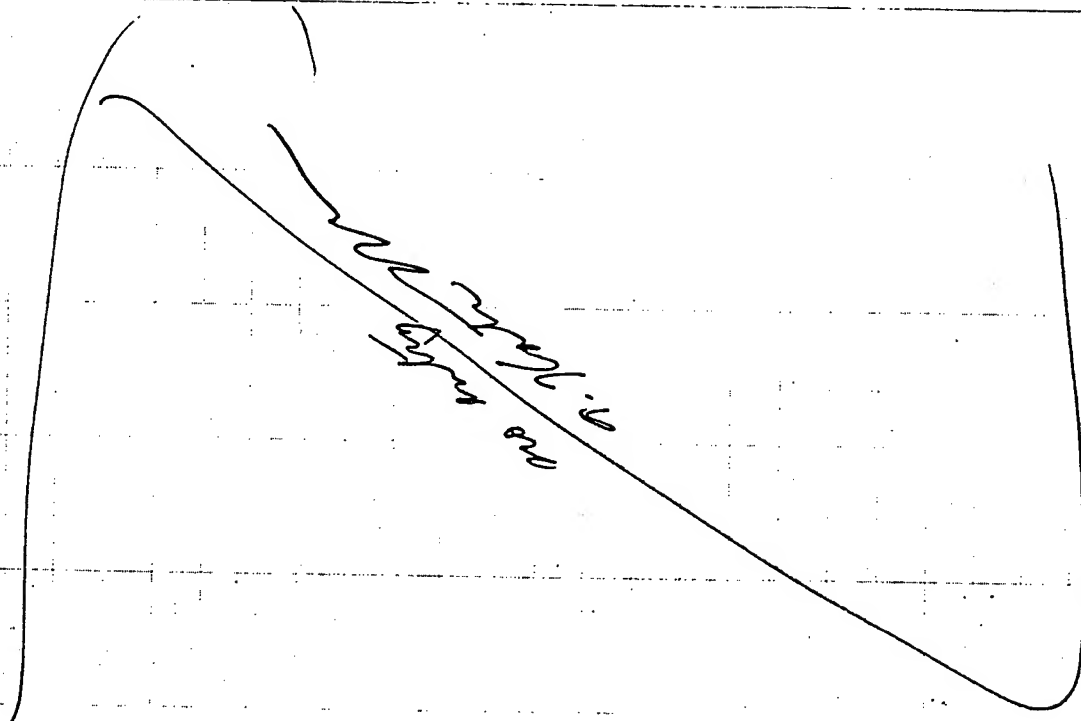
Air bill #4530735123

Samples sent:

026-001BH	2-2.5	8240 8270
026-001BH	9.5-10	6010 7196 7421
026-004BH	2-2.5	
026-004BH	9.5-10	
026-005BH	1.5-2.5	
026-005BH	9.5-10	
026-006BH	11.5-12	
026-006BH	2.0-2.5	
026-005BH	0.5-1.5	
026-001BH	9-9.5 MS/MSD	
EB JVDA	8240	
EB LL	8270	
EB .5L	6010 7196 7421	

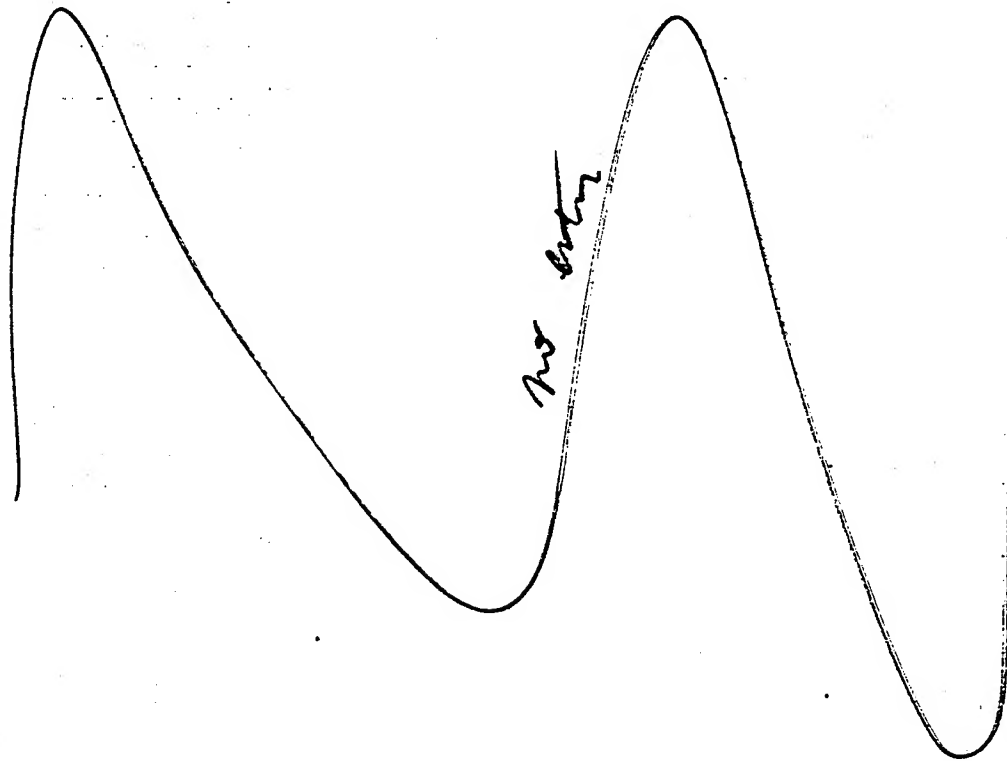
[Handwritten signature]

12-



no water
in
the
lake

3 MAY 95 13
1815 Arrive back at Hotel
END OF DAY



no water

A. K. D.

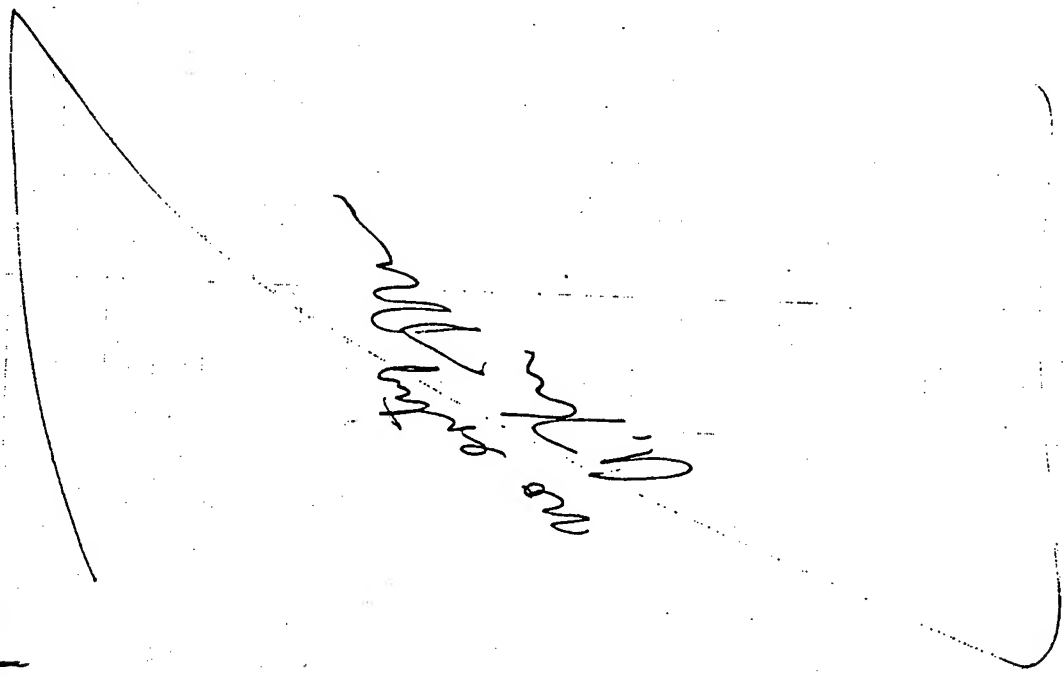
14

W
C
T

15

4 May 95

0545 Met lobby, breakfast
 -0640 planning meeting
 0655- Arrived at site, loaded
 0715 Van. Waiting for
 drillers.
 0715- Contacted fire dept. for
 0815 water supply for drillers
 truck tank.
 0815- Drillers deconed auger
 0845 + light
 0900 Arrive site 26 begin site
 prep
 0900- Health & Safety
 0910 Meeting
 0915 Drillers mob to 026-002
 BH
 0920 Foot of water level = 6.8'
 from ground surface
 0922 Began drilling
 026-002 BH
 A. Johnson



*top of
hole
over*

4 MAY 95

3/3/5/10 0.5-2.5 BLS
No recovery. Sample
collected @ 5-7' Water
level ~ 5' BLS.
Recovery problem on
5-2.5 (moved hole over)
4-6
Moved hole again
0.5-2.0 BLS
Sample @ 2.5-2.0
sample @ 2.5-2.0
from 026-003 BH
sample @ 6.5-7.0
Cleanup site
LUNCH
Break
Waited for drillers
to grant redrilling
026-003 BH to collect
duplicate sample
for 026-003 BH
sample @ 2.0-2.5
(mark 1.5-2.5
ed on loc)
sample @ 1.5-2.0
(marked 0.5-1.5
loc)
1435

1007
1120
1125
1130
1145-
1245
1425

all right on

19

1445 Returned to Bldg 247
to watch drillers decon

right truck

Collect equis blanks.

Return to site 26 to

begin drilling Mus

Driller needing rig equipment cannot

proceed.

Land Truck and

leave site. Pack

Sample cooler - Take

Samples to FedEx

Go to store for

Supplies

Arrive back at hotel

Samples sent:

5-2-2 HSI 200-720 7145

026-002 BM 6.5-1
026-003 BM 12.5-1

Actually $(1.5 - 2.0)$

026.003 B14 (15-2.5)
 6.14.11 (2.12-2.5)

026-003 RH 6-5-70

026-002-RB(3 VOA)

026.002-RB (16 Amb)

926:002 - RB (5 P/as)

W. H. H. H.

END OF 12/26/94

5 May 95

0545 Meet lobby Hotel 90
to breakfast +
planning meeting
0635 Arrive at base
-0745 load supplies

0800

Arrive Site 26

Begin drilling 026-001M

0935

Drilled down 22'

water ~ 17.2'

0945

water 17.2' BLS

well constr: 026-001MW

15-25' BLS screen

13-26' BLS sand

11-13' BLS bent

4-11' BLS grout

0-4' cement

1045

Randy Wolf arrived on

site from AET, Inc.

to bring well complet.

Equipment.

Wheelabrator Screens Sch 40 Slot 10

Johnson

29578C

29594C

Sand Red Flint #5/55

5 May 95

23

- 10 screen down hole
- (10' sections) 'cap

(50) bags of sand
down hole

LAUNCH

1230-

130

1430

1445

- 24.2 Bottom of screen
- Bentonite seal installer
- Well casing left in hole w/ bentonite

seal, cement &

flush mounting

will be done at a

later time

Return to BLDG 247

to pack up supplies.

Left site to go

out to Target

for supplies

Returned to hotel

END OF DAY!

A. K. M.

24

6 May 95

0545

0645

0750

0800

0805

0832

0837

0900

0904

0920

0929

1000

Met for breakfast
& planning meeting

Arrived on base

load truck.

Drillers arrive

Decon split spools

Health & Safety

briefing.

collar @ 5-7 from

(Q26-003MW)

petite recollected

6.5-2.5 again collected

poor recovery. 15-17*

wl = 8.7 BLS

recollect 0.5-2.5

no recovery

wl = 6.3' BLS

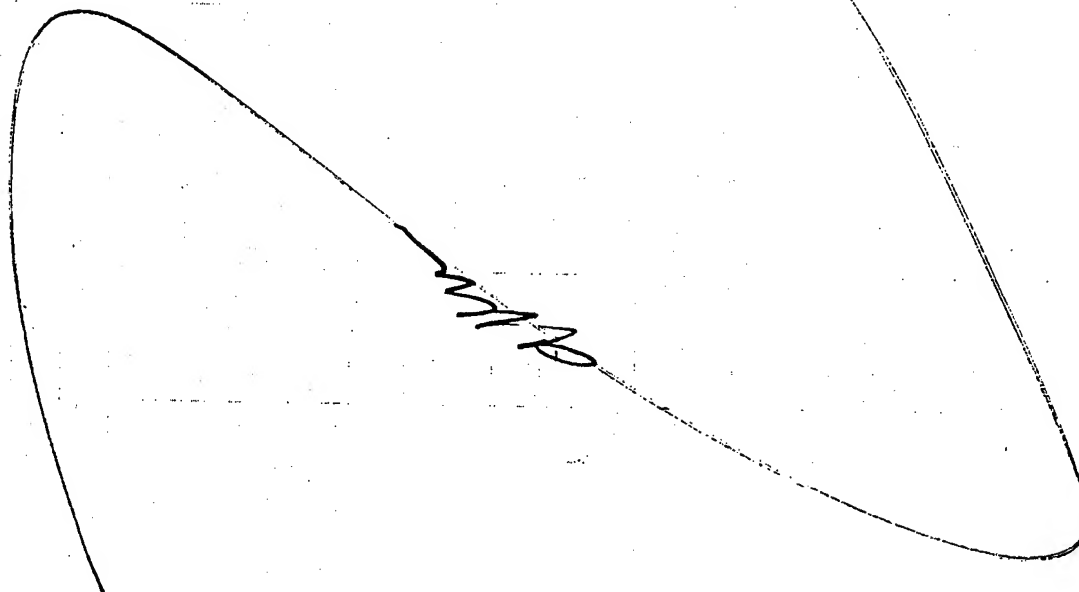
wl = 6.3' BLS

set bottom

Screen at 15.5' BLS

* Geotechnical sample

25



6 May 95

1100

1200

1230

1300

1330

1500

1530

LUNCH

Returned to site

Began drilling

026-002 MW

sample @ 15-17

for geotechnical

well construction

left augers in

ground to allow

water to stabilize

Return to 86126

2471 unland

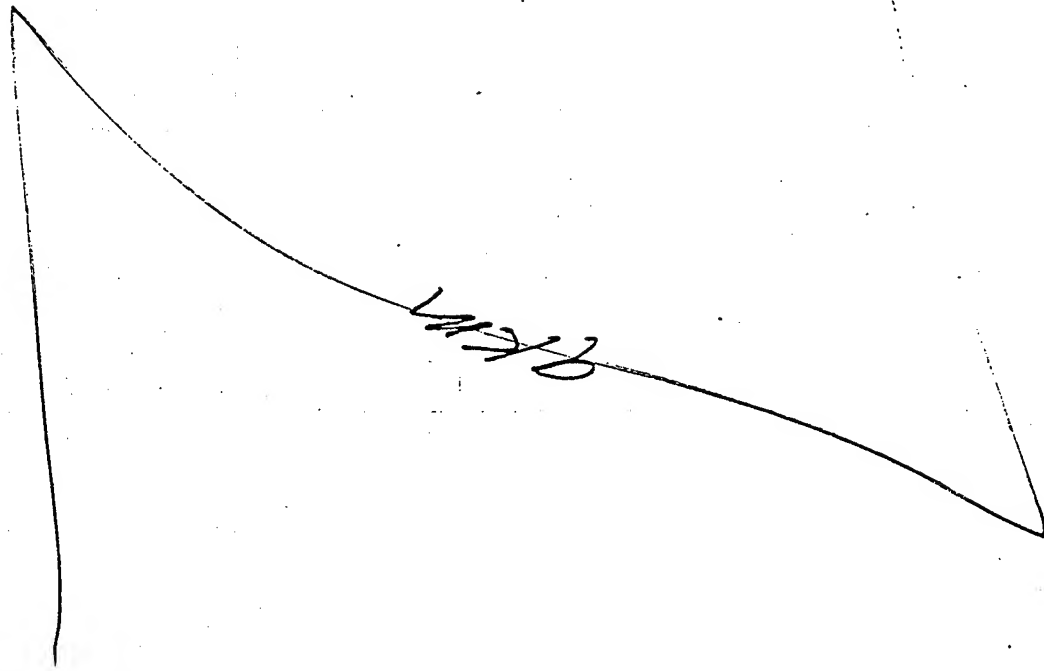
supplies

1612 site

END OF DAY

After

28



29

8 May 95

0545 Met lobby

Breakfast

0600
-06450650 Arrive on site
load supplies in
truck0745 Drillers arrive on-
site HES meetin
check water level0800 at 026-002 MW
wl = 13.4' BLS
0820 Drilling down to 22'
due to wl measure-
ment.0830 $\frac{25117}{30}$ Lith sample from
20-22 collected
wl = 11.3 BLS

0830

Begin well const.

1015

Top of sand 6.4'

BHS 45105 BLS
Red f-lint sand

a-z-h-w

30

plan

31

8 MAY 55

1030

Bottom of screen

15.4' BLS

TD: 20'

Finish constr.

6.11.54

Arrive site 26-

Surface completion

of well & leave

site due to

weather

Depart Duluth

END

OF

DATA

1530

OK

C. L. Thomsen

9 May 95

0645 Met lobby, check-out
 hotel. Breakfast
 and planning
 meeting

0645 Arrived on base.

Weather: rainy
 cold temp 40°F,
 wind chill 16°F

0700 Call drillers

0800 Driller steam

-1000

clean drill rig
 Cull terrain
 rig) and clean
 other rig

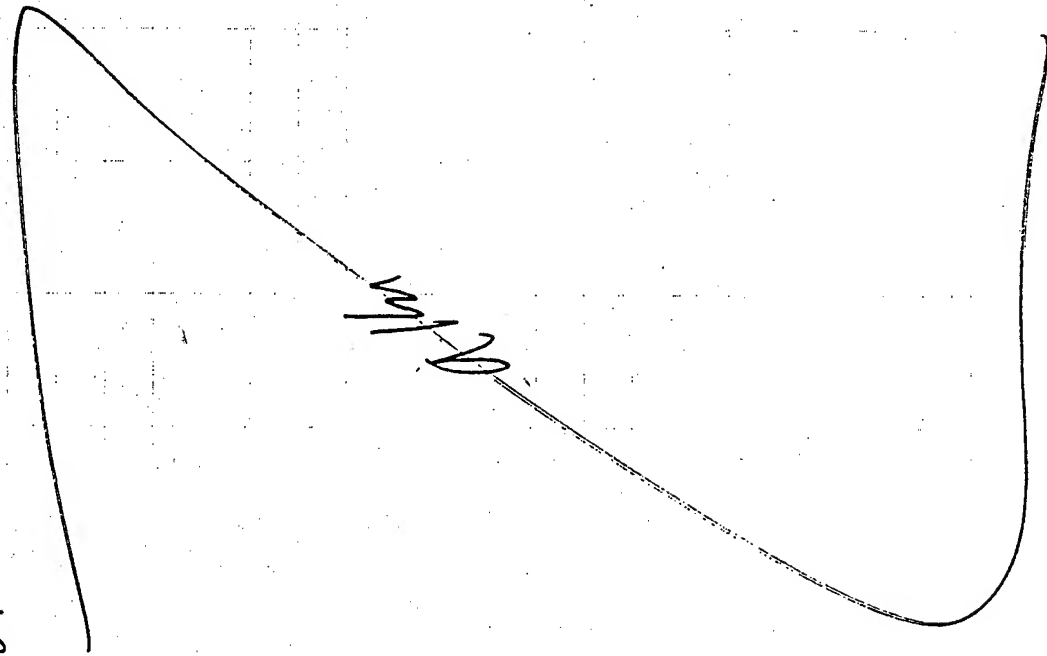
1030- Return to Hotel

1100

END OF DAY

2/5/95

W. H. H.



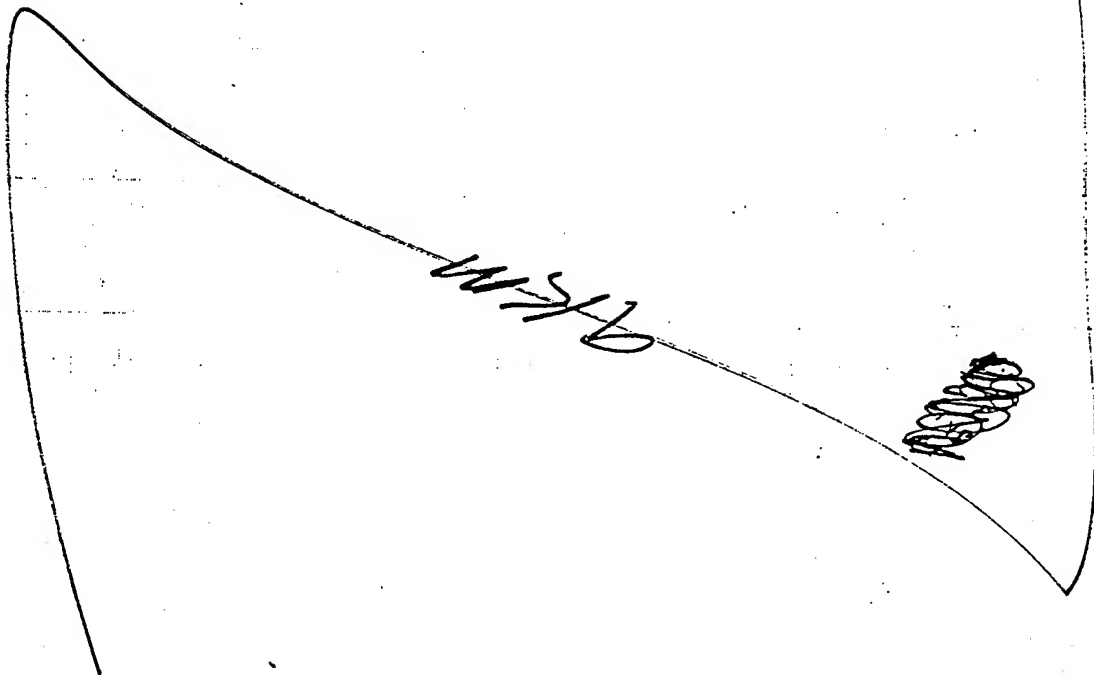
10 May 95

0545 Met lobby, breakfast,
 0630 planning meeting
 0645 Arrive on base
 -0730 set up at site 25-
 025-001 MW
 0735- Measure w/ at 021-004 MW
 0740 wl = ~~6.5'~~ ^{9.6m} 11.68'
 BTOC

0745 Drillers arrive -
 025-001 MW
 0810 H&S meeting
 0820 Begin drilling
 0950 Drilled to 27', hit
 water ~ 22' BLS
 0955 wl = 23.8' BLS
 1000 wl = 23.5 BLS
 1010 wl = 23.2 BLS
 1020 wl = 23.2 BLS
 1100 Drilled to 35'
 ^{9.1m} 32.5
 Drilled to 45' BLS
 hit bedrock ~ 328'
 According to rig
 Response

J. M.

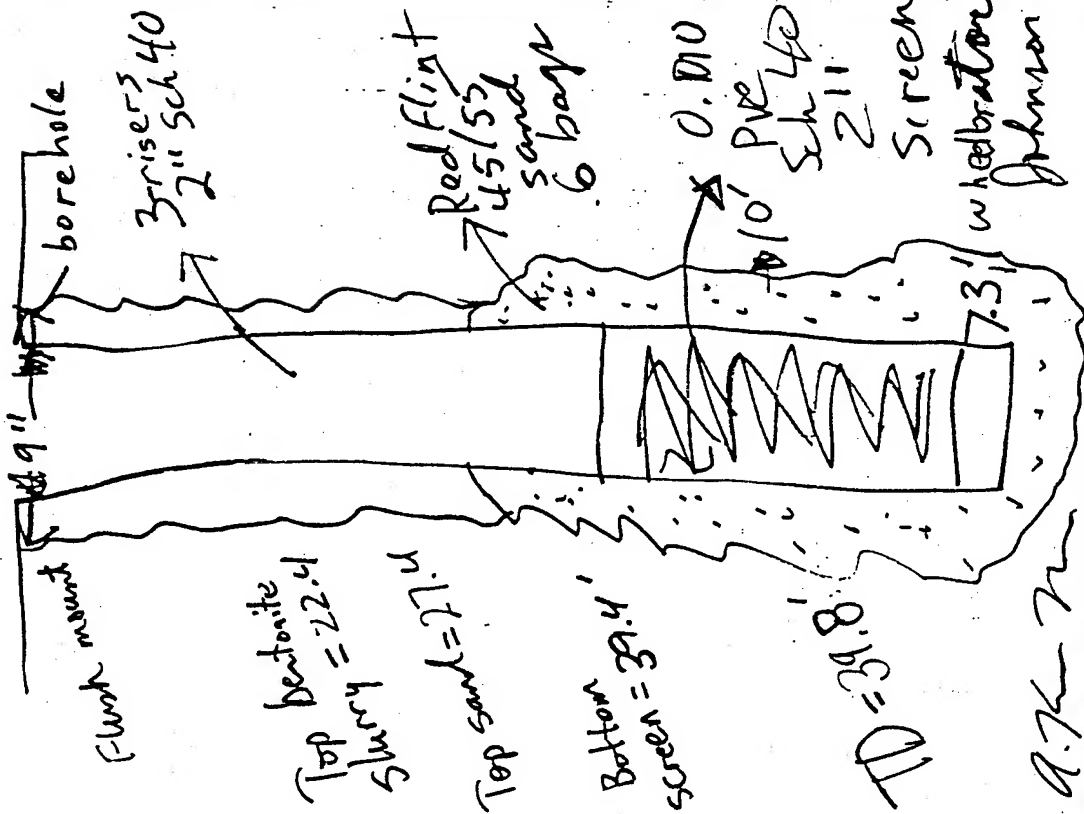
36



37

025-001 MW
LUNCH
wl = 34.65' BLS

10 May 95
1130
1230



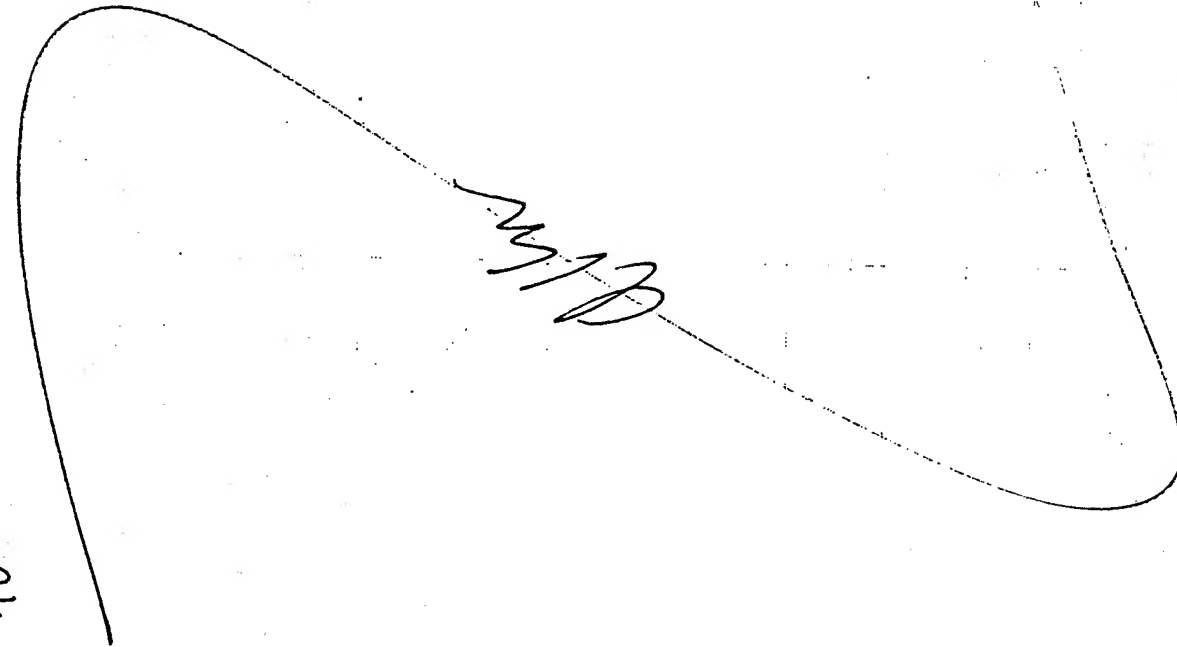
A. K. M.

A. L. M.

1235	Screen & riser pipe inserted
2250	Sand tremied down borehole
	tremie pipe decom w/ steam cleaner
1406	Sand at 27.4' BLS
1435	Slurries at 22.5' BLS
1500	Removing final auger
1530	Bottom of screen
	39.4' BLS
1535	Drillers start decom flights & truck
1600	Set up over
	(025-002 MW)
1605	Begin drilling
1612	0.5-2.5 sample 0.5-2.5 collected
1620	5-7 collected
1630	10-12 "
1635	15-17 "

A. L. M.

40



Alm

41

10 May 95

1645-

1715

1720-

1600

Loaded supplies
in Bldg 247

Arrived at Site 26
to meet JB. who has
been developing site
26 monitor wells

Returned to hotel

247

6/7-71h

42

43

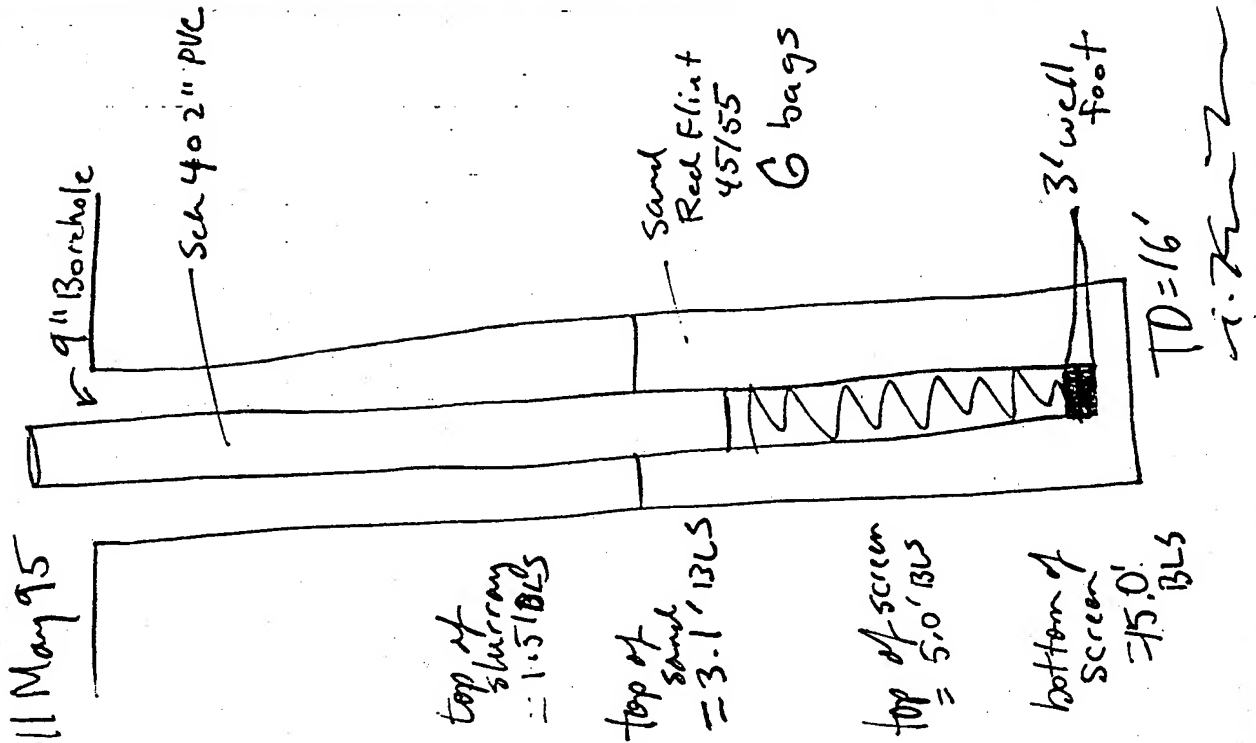
11 MAY 95 Weather: sunny 40-65°F
 0545 Met Hotel, break-
 fast, planning meeting
 0645- Arrive on base, set
 0720 up for drilling at
 location near BLDG
 2nd 7 (South of)
 Drillers arrive at
 Site 25. HES meeting
 0745 Wl at 025-002 MW
 Wl = 6.0' BLS
 Wl at 025-012 PM
 Wl = 7.11' BTDC
 TOC \approx 2.2' above LS
 Wl \approx 5.89' BLS
 TD = 16.90' BTDC
 0755 025-002 MW
 -Drill ^{size} advanced augers
 to ~~45'~~ 16.0' BLS
 0815 Began well constr.
 10' Sch 40 PVC Screen
 Wheelabrator Johnson
 0820- Drillers' steam cleaned
 0835 Tremie pipe

A. K. N.

44

AKM

45



11 MAY 95

0840

Began treming sand
down borehole

0922

Top stable sand =
3.1' BLS

Bottom of screen =

15.0' BLS

0950

Began preparing
concrete

1050

Installed riser pipe
and guard posts

1115-

LUNCH

1230

Drillers begin decon
of riggers & truck

1230

1300

Finish decon

1310

Set up over

025-003 MW, stabilizing
rig on hill.

1345

Moved hole over
~50' north to a

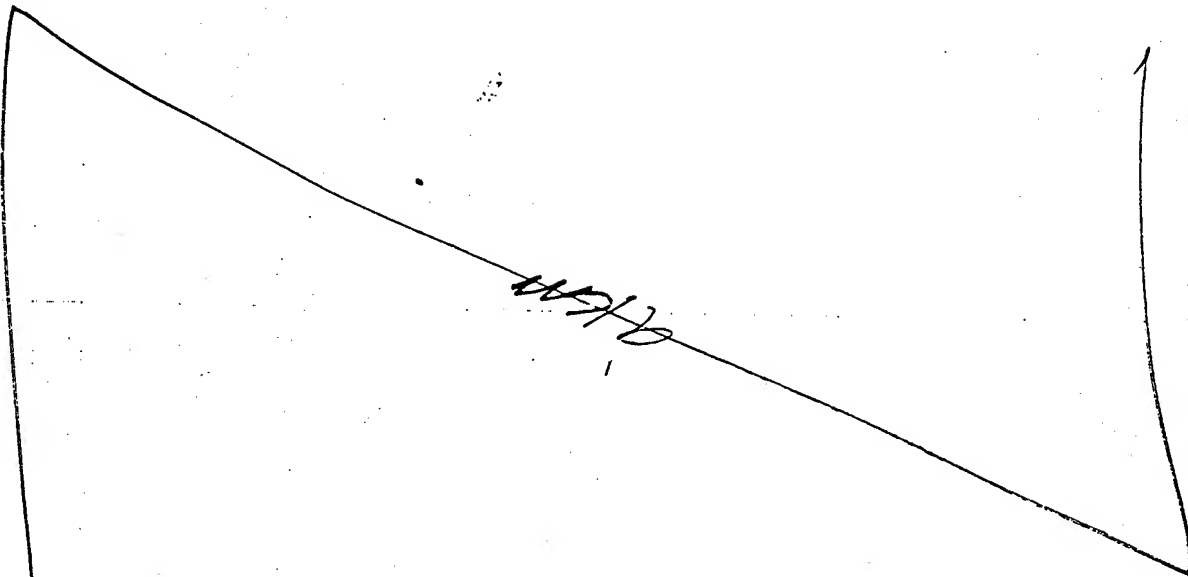
more stable location

Began preparing for
drilling.

A. K. M.

A. K. M.

48



1400
1415
1420
1425
1435
1440

alt
= 4.0

Top of sand = 7.6'

Top of sand = 7.6'

Top of
screen
= 9.7

bottom of
screen
= 19.7

49

025-003MW

collected 0.2-2.5'

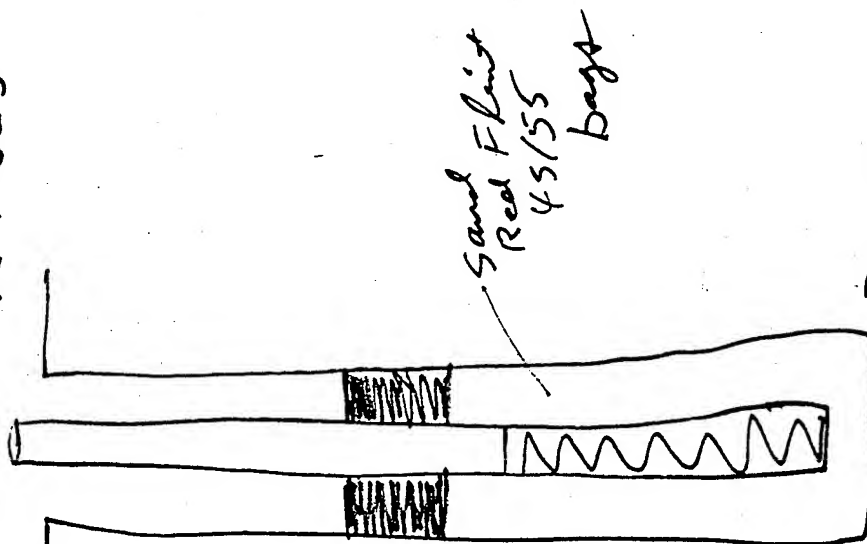
5-7'

8-10'

15-17'

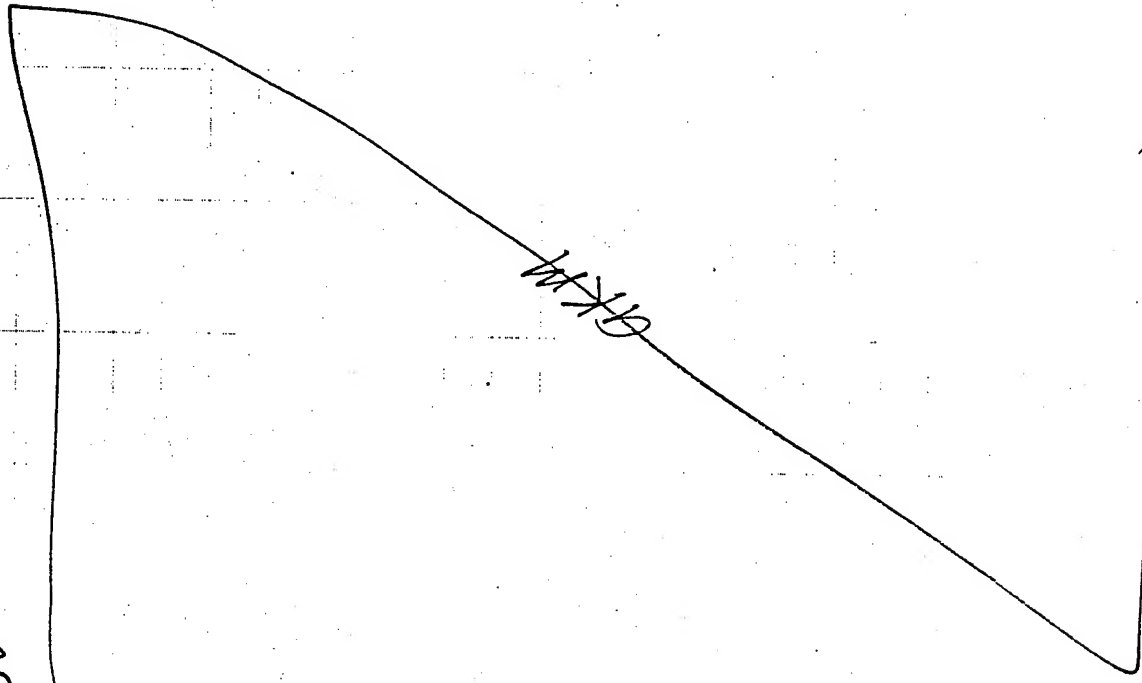
20-22'

wl = 12.7' BLS



TD = 21'

50



51

1450 Drillers begin well constr.
 1500 Drillers begin sand treining
 PID = 40 ppm at top bk
 1510 Borehole opening
 PID = 6.0 ppm
 Breathing zone
 PID = 0.0 ppm
 Borehole opening
 PID = 8.3 ppm
 1520
 1530 Top of sand = 7.6'
 1540 Bottom of screen = 19.7'
 1550 Top of bentonite = 5.5'
 1554 " " = 4.0'
 1615- Finish loading supplies
 1625 in BUDG 247. Drillers
 installed riser casing
 Drillers leave site
 1630 Leave for hotel

END OF DAY
 A. J. H.

12 MAY 95

Weather sunny,
warm 80-70°F
Met hotel lobby,
breakfast, planning
meeting

0545

0630
0635

Arrive at base
Set up at Site

25. Drillers completing

guard post and
surface completion
of 001-002 wells
Drillers begin decon
of rig & flights
Finish decon mob
to 025-0088H

0930

1000

sample @ 0.5-2.5 screen
ing only

1020

1027

sample @ 5-7 - no recovery

1035

sample @ 7-9 screen only

1046

sample @ 9-11 lab + screen

1100

sample @ 13-15 lab & screen

.6" Borehole diameter

.2 1/4 washer

1125

Broke down for lunch

OKM

Return to site prepare
for 025-011 BH

1240 Sample @ 0.5-2.5 lab
1300 Sample @ 5-7 lab
Move d + 025-010 BH

1320 Sample @ 0.5-2.5 no rec.
1330 Sample @ 5-7 (lab)
1340 Sample @ 0.5-2.5 (lab)
1345 move to 025-007 BH

1400 Begin drilling on even
1415 Sample @ 0.5-2.5 lab
1420 Sample @ 5-7 lab
1430 Sample @ 11.5-12 (marked)
marked Dup sample @ 11-11.5 (marked)
(1440) Sample @ 11.0-11.5 lab
MS/MSD sample @ 14.5-15.0

1500 Begin drilling 025-006 BH
1505 Sample @ 0.5-2.5 no lab
1510 Sample @ 5-7 no lab
1520 " 10-12 no lab
1535 " 18-20 no recovery
1545 " 20-22 lab
1550 All augers

A. K. M.

12 MAY 95

1600

Sampler to lab:

- 025-008 BM 10.5-11'
- 025-008 BM 14.5-15'
- 025-008 BM 2.0-2.5'
- 025-010 BM 6-6.5'
- 025-011 BM 5.5-7.0 20-2.5'
- ~~• 025-001 BM 6-6.5'~~
- 025-011 BM 6.5-7'
- 025-006 BM 2.5-2.2'
- 025-009 BM 11-12
- 025-009 BM 10-12 (DNP)
- 025-009 BM 14.0-14.5
- 025-009 BM 14.5-15 MS/MSD

Equip blank:

3 VOC 8240

1 Lab 8270

1 Plus Metals

Prepared equip blank
(025-001 RB)

1625

1630

1730

1810

Load sample cooler
& ship to Fed Ex
Arrived at hotel

A. Klein

Align

15 MAY 95

0545 Meet lobby, breakfast
& planning meeting

0630 Arrive at base

0635 Goto store for supplies

0645- Prepare Site 25 for

7308015 drilling. Drillers obtaining
water.0930 H. Calth & Safety
meeting

0935 Set up over drill rig

on 025-003 BH

sample @ 5-2.5

0948

0952

1000

1000 ^{marked} (1005)

1032

1032 (1040)

1040

1052

sample @ 11.5-12 (11-12)

" 11.0-11.5 (10-11)

" 16.5-17 (16-17)

" 16.0-16.5 (16-17)

" 20-22

" 23-25 recovery

~~TD = 25' on 025-003BH~~
align

D. K. L.

15 May 95 Sunny, cool, breezy 90-60°F.

~~03-0003 BH~~ drilled to 27' ^{all} screen only
~~TD = 27.5~~

1105

sample at ~~25.25~~ ^{all} screen only
 24-25

(24-25' sample represented
 slough from 24-25)

TD = 25' on 025-003 BH

1120

Decon site for next
 hole, drillers grouting
 025-003 BH.

1220

Return from lunch

and setting over

(025-002 BH)

1245

sample @ 5-25

1250

5-7

1305

10-12

1310

LEL = 12

PID at brown 420ppm

stopped drilling

1320

K.P. calling office

borehole opening = 12.4ppm

1325

" " = 11ppm

LEL = 0

Wm

15 MAY 95

1430

1500

1542

1600 -

1740

1750

1630

Moved to 025-09(BH)

Sample @ 5-2.5

1, 5-7

LEL = 11, shut
down core hole

Began cleaning up
site and selecting
samples to send to
lab. Pack cooler.

Dropped samples
at Fed Ex

Stopped for supplies
Arrived at hotel
END OF DAY

W 7/10

W 7/10

W 7/10

16 May 95
0545

0630

0645

0800

0820

0827

0835

0840

0850

0900

0935

0940

0950

1001

1015

1020

1025-

1110

Met hotel, breakfast
Planning meeting
Left for base with
arrived at base
Set up for side
and H & S briefing
collected 5-2.5
at 025-007814

Sample 6 5-7

" 10-12 LAB^{11.5}₁₂

" 15-17

" 20-22

TD = 22'

Moved to 025-005 B41

sampled 0.5-2.5

" 5-7 No rec.

" 10-12 LAB^{11.5}₁₂

" 18-20 No rec.

" 20-22

TD = 22'

Driller's remove auger

Driller's remove auger

A. K.

1115
1125
1135
1140
1150
1200
1300-
1330
1355
1400
1405
1415
1430-
1435
1440
1450
1458

1510
1525
+535 sec
1535

ID=61

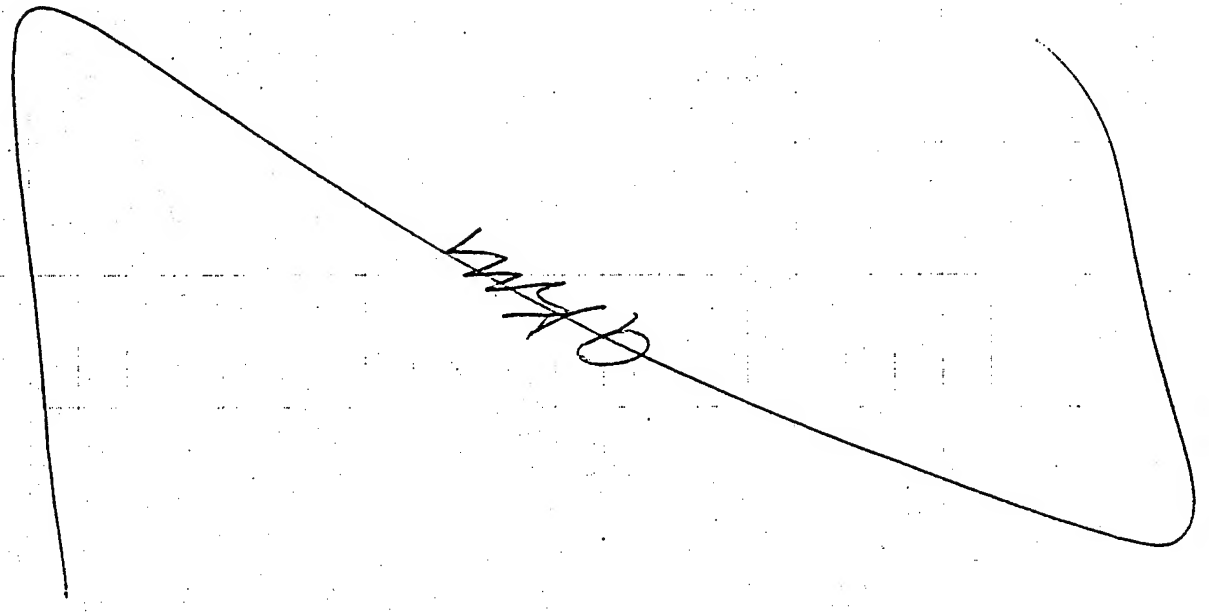
Setup at 025-004 BH
Sample @ 5-2.5
" 5-7
" 10-12 LAB 11.5-
" 18-20 LAB 11.5-

UUPH
Set up at site 21
Setup 21-026 BH
Sample @ 5-2.5 ^{no} _{recon}
" 4-6
" 8-10 LAB 9.0-
" 5-2.5 LAB 2.0-
Move to 21-027 BH

Sample @ 5-2.5
" 4-6 LAB (555-
" 8-10 LAB
Sample 9.5-10 9-10 ^{marked}
Sample 7.0-9.5 8-9 ^{marked}
Move to 026-028 BH

Sample @ 5-2.5
LAB 2.0-2.5 1.5-2.0
Sample @ 8-10 4-6
LAB 5.5-6.0

A. J. [Signature]



16 May 95
1400-0034
1800

Packed sample cooler,
unloaded supplies,
took equip blanks,
shipped samples
from Site 25 at
Feed EX and
dropped Site 21
Sample @ Lake
Superior lab
END OF DATA

24/10

24/10

A. Hunter

17 May 95

0545

0615

0630

0730

0730

0815

0830

0835

0837

0842

0850

0900

0905

0910

0928

0935

0940

Sunny, cool 35-60

Plot Abby, D.G. &

K.M. to site

Set up at site

25

Drillers set up

and decon

Health & Safety

Meeting

Set up 025-012 MW

Sample 025-2.5

11 5-7 LAB 6.5-7.0

11 10-12 LAB 11.5-12

11 18-20 LAB 19.5-20

Move to 025-013 BH

Driller decon drill in

liquefactive tub and

these w/ deionized

water, this procedure

has been followed

throughout this S.I.

Sample 025-2.5

11 5-7

Check G.C. results for

025-MW-1 (clean) MW-2 (clean)

025-003 MW (dirty)

11 May 95

K.P. & C.W. collected drums

1005 sample @ 10-12 11.5-12.1 AB

1015 " 18-20

1030- broke down site

1330 setup at site 17,

Lee NHC

1333 Sample @ 1.5-2.5 1.5-2 LAB

1340 " 4-6 5-5.5 LAB

1345 " 8-10 10 Lab

from 017-024 BH

Moved to 017-025 BH

1400 sample @ 5-2.5 1.5-2 LAB

1405 " 4-6 5-5.5 LAB

Moved to 017-022 BH

1425 sample @ 1.5-2.5 2-2.5 LAB

1430 " 4-6 No LAB

Moved to 017-023 BH

1450 sample @ 1.5-2.5 1.5-2 LAB

1502 " 4-6 5-5.5 LAB

Moved to 017-028 BH

1500 sample @ 1.5-2.5 1.5-2 LAB

1535 " 4-6 5-5.5 LAB

1545 " 4-6 5-5.5 LAB

A. K. M

17 May 95
1600 L
1845

Pack coolers, clean-
up site, went
to Fed Ex to
drop off samples
return to Site 17.
Packed supplies
Return to
Hostel
END OF DAY

1845

G. F. F. F. F.

18 May Weather: sunny warm to 70°!
0545 Met in lobby, breakfast

0630 Planning meeting
Rounded base area
Prepared for sampling
and ~~about~~ slug

Resting.

0745- Went to hardware
0815- store for supplies.
0830 Called Mike Superior
Lab. Tim will send

GEO results over, and
DID will come later
Results from yesterday
are to be fax tonight

0835 K.P. calling office
0915 Finish packing
supplies and preparing
sample bottles.

1000 Packed down
drillers to obtain
~~sample~~ ^{also} monitor well
keys for sampling

A. Th. N.

1015

Started sleep test
for 02500, MW
Stopped test
Obained lunch and
bought supplies
Started test for
025-003 MW
Stopped test
Left base
Arrived back at
hotel
END OF DAY

1337

1545-

1515

1530

1800

1830

1900

Alma

~~11A~~

11.7a 2

Weather

19 May 95 Sunny, warm, 70°F ☺

0643 Arrive at base and

load supplies

Move to Site 17 and

prepare for drilling

Setup on (017-318H)

Sample @ 5-2.5 Polat

4-6 (5.5-6
5-5.5)

" 5-2.5 no lab

" 5-2.5 (3-2.5
3-2.2)

Move to (017-021 BH)

Sample @ 5-2.5 (2-0.2-2
1.5-2)

" 4-6 (5.5-6
5-5.5)

Move to (017-032 BH)

Sample @ 5-2.5 (2-2.5
1.5-2)

Move to (017-030 BH)

Sample @ 5-2.5 (2-2.5
1.5-2)

" 4-6 (4.5-5.5
5-5.5)

Move to (017-029 BH)

Sample @ 5-2.5 (no recovery)

4-6 gm

Sample @ 5-2.5 (2-2.5
1.5-2)

1032

Alpha

19 May 95
1100-1200 ^{AM}
1200-1345
1500
1500-1800

LUNCH
Slug Test
025-002mm
Pack supplies
and samples
decon slug
equipment
Drop samples
at FedEx
Flight cancelled
return to Radisson
Hotel

1800-1830

1830-
1900

WMA

A. K. M.

20 May 95
900

Flight leaving

for SA

Arrive at SA

01643

[Handwritten signature]

[Handwritten signature]

[Handwritten signature]

800-937-6MAN

3

Joe Byrd, JR.

Project Scientist

4100 NW Loop 410, #230

SAN Antonio, TX 78229

(210) 731-0000 1-800-677-8072

DULUTH 1315-197

% Capt. Stephen Wabrowetz

148 FG/LGPT, Bldg. 240

4625 Deuce, Duluth, MN 55811

(218) 723-7475

~~(218) 723-7476 (FAX)~~

Radisson Hotel - Duluth

505 W. Superior Street

DULUTH, MN 55802

(218) 727-8981

①

TRAVEL DAY MONDAY 1 MAY 1995

0447 leave home
1440 At Duluth, Go to AUGB &
meet up w/ KP-KM
unpack stuff & go stake
site, 25
1620 leave base
1700 At MoCoL & checked in

6
14.5
4.8
12.2

12.2 hrs

JBrydger

CONTACTS

FEDEX 1342-6486-1 (1-800-238-5355)
HAZCO 1-800-332-0435
AIR Products 1-800-224-2724 (755509)
ETS 1-800-532-7474

1-800-741-9000 / O + # 21073100010192879

Burlington Exp. (210) 402-1212 (53144410)

Duluth Airport Authority (210) 727-2968
•• HANK STORMS

PENTANE P.O. # 5641

HAZCO
COMPANY 554657

2 MAY 95

(2)

Tuesday DAY 1

0708 Leave for base
Breakfast. (0.7)
0835 ON BASE
Meet w/ Wabrowetz & Berg
They are in meeting for
Goto B247 & prep for
staking out sites.
1016 Bruce is here. Go to
Site 26
1115 Done. Goto B252
Scope out GC Room
1124 Goto lunch
1224 Back on base. Haul
stuff to GC room
1321 Goto store to get supplies
1446 Back on base
Set up GC Room



1648 Leave base
1705 At hotel

8.3hr

[Signature]

7.8
8.8
6.1
17.1
8.8
8.3

DAY 2

(3)

WEDNESDAY 3 MAY 1995

0515 Leave Hotel

BREAKFAST (0.7)

0645 ON BASE

Get-up GC.

BUILD 10PPM, 1PPM, & 100 PPM

BTEX STDs.

0801 100 PPM BTEX. Printer not printing

~~SET LIBRARY J3~~

$$\begin{array}{r} 5.7 \\ .7 \\ \hline 6.4 \end{array}$$
~~--- JB ---~~

GAIN

1,000

CARRIER GAS FLOW

12 μ l/min

INJECTION VOL

100 μ l

GC OVEN TEMP

40°C

ANALYSIS TIME

500 sec

~~--- ---~~~~CALL ON J3~~

CALL M. ALEXANDER.

0836 SHUT DOWN GC & REPROGRAM

to TRY & UNLOCK PRINTER.

0955 TALK to C. HAYWARD. PRINTER

IS TOTALLY OUT. M. ESCOBAR

IS SENDING me A NEW ONE.

Prep. Printer for shipment
BACK TO OPTech

JB

3 MAY 95

(4)

1020 Goto FEDEX to ship
printer.

1040 BACK FROM FEDEX
waiting

1130 Goto Site 26.

1147 Begin setup AT Site 26

1616 Leave Site 26

1621 AT 0252. Play in PIDS

1630 AT 1547.

UNLOAD CARS. Prep For
TOMORROW.

1650 TAKE EQUIPMENT BLANK.
Goto store to get 100.

1730 KP-KM Goto FEDEX.

1734 LEAVE BASU

1754 AT Hotel

17.9
6.4

11.5

[Signature]

11.5

[Signature]

DAY 3

5

THURSDAY

4 MAY 1995

- 0545 Leave hotel
Break Fast (0.7)
0645 On Base
Pack vehicles for day
0710 Calibrate both PIDs to
100 ppm w/ Isobutylene
0757 Goto Fire Dept. to get
water.
0715 Drillers decom Augers
0841 Goto Site 26
0851 Health & Safety Mtg
• JB, DG, KM, Jamie, Jonathan
KP Mci.
• Emergency #
• Drillers phone
• Jet Blast
• Tripping HAZARD
0855 Set-up for drilling
Drilling
1049 Leave Site 26. Go get
Printer & CAL gas
Goto B252 & set up
GC

[Signature]

4 MAY 95

⑥

Build 10 PPM, 1 PPM, 100 PPB
BTEx STD's.

GAIN

1,000

CARRIER GAS FLOW

12 μ l/min

INJECTION VOL.

100 μ l

GC OVEN TEMP

40°C

ANALYSIS TIME

500 sec

1155 100 PPB BTEx STD.

Good RUN. SET LIBRARY

1214 1 PPM BTEx STD

Good RUN. SET LIBRARY.

1230 10 PPM BTEx STD.

Good RUN. SET LIBRARY.

1246 AIR BLANK

● BENZENE 10 ppb

● Toluene 4 ppb

● E-BENZENE 8 ppb

● M,P-Xylene 14 ppb

● O-Xylene 9 ppb

1257 026-004 DH 0.5'-2.5' 10 g

● BENZENE 11 ppb

● Toluene 4 ppb

● E-BENZENE 5 ppb

● M,P-Xylene 9 ppb

FB

4 MAY 95

7

1310 026-004 BH 5'-7' 10g
● O-Xylene 4 ppb
● BENZENE 7 ppb
● Toluene 3 ppb
● E-BENZENE 2 ppb
● M-P-Xylene 5 ppb
● O-Xylene 2 ppb
1322 026-004 BH 8'-10' 10g
● BENZENE 1 ppb
● Toluene 2 ppb
● E-BENZENE 2 ppb
● M-P-Xylene 4 ppb
● O-Xylene 3 ppb
1334 026-001 BH 0.5'-2.5' 10g
● BENZENE 7 ppb
● Toluene 1 ppb
● E-BENZENE 3 ppb
● M-P-Xylene 17 ppb
● O-Xylene 26 ppb
1346 026-001 BH 5'-7' 10g
● Toluene 2 ppb

J. B. [Signature]

4 MAY 95

(8)

1358 100 PPB STX STD

	CAL
Benzene	100 ppb
Toluene	102 ppb
E-Benzene	101 ppb
MP-Xylene	211 ppb
O-Xylene	105 ppb
- - -	B - 3 - B

1410 AIR BLANK

- Toluene 1 ppb
- 1422 026-004 05'-25' 10g Reshot
- Toluene 2 ppb
- E-Benzene 1 ppb
- MP-Xylene 14 ppb
- O-Xylene 11 ppb
- 4 1334 026-001 BH 8'-10' 10g

- Toluene 2 ppb
- E-Benzene 2 ppb
- MP-Xylene 11 ppb
- O-Xylene 5 ppb
- 1446 026-005 BH 10'-15' 10g
- 13-1446 ● Toluene 2 ppb
- MP-Xylene 5 ppb
- O-Xylene 3 ppb

J. Byrd

4 MAY 95

9

1458 026-005BH 6'-6.5' 10g

- Toluene 2 ppb
- E-Benzene 2 ppb
- MP-Xylene 5 ppb

1510 026-005BH 10.0' 10g

- Toluene 1 ppb
- MP-Xylene 2 ppb
- O-Xylene 1 ppb

1522 100 PPB BTEX STD

	CAL
Benzene	93 ppb 100 ppb
Toluene	89 ppb 100 ppb
E-Benzene	83 ppb 100 ppb
MP-Xylene	171 ppb 200 ppb
O-Xylene	95 ppb 100 ppb

1538 AIR BLANK

- E-Benzene 1 ppb

1556 026-006BH 0.5'-2.5' 10g

- Benzene 7 ppb
- Toluene 2 ppb
- E-Benzene 2 ppb
- MP-Xylene 4 ppb
- O-Xylene 4 ppb

J. Byrd

4 MAY 95

10

1615	026-006BH	6.0'-6.5'	10g
	• Toluene		1 ppb
	• MP-Xylene		3 ppb
1627	026-006BH	11.0'-11.5'	10g
	• Benzene		5 ppb
	• Toluene		2 ppb
	• MP-Xylene		4 ppb
	• O-Xylene		2 ppb
1639	026-002BH	0.5'-2.5'	10g
	• Toluene		2 ppb
	• E-Benzene		1 ppb
	• MP-Xylene		2 ppb
1651	026-002BH	5'-7'	10g
	• Toluene		1 ppb
1704	100 PPA BTEX STD		CAV
	Benzene	90 ppb	100 ppb
	Toluene	81 ppb	100 ppb
	E-Benzene	81 ppb	100 ppb
	MP-Xylene	159 ppb	200 ppb
	O-Xylene	73 ppb	100 ppb
1719	AIR BLANK		
	• E-Benzene		1 ppb

gBjgkfr

4 MAY 95

(11)

1731 026-003BH 0.5'-2.5' 10g

● Toluene 2 ppb

● E-Benzene 1 ppb

● MP-Xylene 8 ppb

● O-Xylene 2 ppb

1743 026-003BH 5'-7' 10g

● Toluene 2 ppb

● MP-Xylene 4 ppb

1756 100 PPB BTEX

	ppb	ppb	ppb	ppb	ppb	ppb
BENZENE	109	96	95	181	88	109
TOLUENE						
EBENZENE						
MP-XYLENE						
O-XYLENE						

1809 BEGIN GC shut-down

Secure B252

Secure B247

1829 LEAVE BASE

1848 AT HOTEL

18.8
6.4
12.4

12.4hr

DAY 4

(12)

FRIDAY 5 MAY 95

0545 LEAVE hotel
Breakfast (0.6)

0643 ON BASE

Goto B252 & calibrate
PIDs

LOAD vehicles to goto
Site 26.

0715 WAITING for drillers.

0745 Goto Site 26. set up

0810 Safety mtg.

JJ, DG, KP, KM, Jamie, Jonathan

• besafe

• cold

• Jet blast.

0815 START drilling MW-026-001

1015 Goto B252

1020 AT B252. perform GC maint.

Build 10PPM, 1 PPM, 100 PPB

BTX STDs. PROGRAM GC

GAIN

CARRIER Gas Flow 12 μ l/min

Injection Vol 100 μ l

GC Oven Temp 40

5.7
-0.6
6.3

5 MAY 95

13

ANALYSIS TIME 440 sec

1133 100 PPB BTEx STD

Good Run. Set Library.

Screw-up on Library entry

1201 100 PPB BTEx STD

Good Run. Set Library.

1222 1 PPM BTEx STD

Good Run. Set Library.

1238 10 PPM BTEx STD

Good Run. Set Library

1302 1 PPM BTEx STD.

--- Recorded m,p-xylene at

~~1313~~ 1 PPM in Cal. Run. Reshort
& reenter in Library

1317 AIR BLANK

• Benzene

4 ppb

• Toluene

4 ppb

• E-Benzene

6 ppb

• m,p-xylene

13 ppb

1328 026-001 MW

1.0-2.0' 10g

• Toluene

3 ppb

1339 026-001 MW

5'-7' 10g

• Benzene

4 ppb

• Toluene

3 ppb

HB

5 MAY 95

14

GL PROCEDURES

● E-BENZENE 3 ppb
● MP-XYLENE 13 6 ppb
1350 026-001 MW 10'-12' 10 g
● BENZENE 3 ppb
● TOLUENE 3 ppb
● E-BENZENE 2 ppb
● MP-XYLENE 6 ppb
● O-XYLENE 5 ppb
1401 026-001 MW 12.5'-14.5' 10 g
● BENZENE 3 ppb
● TOLUENE 3 ppb
● E-BENZENE 3 ppb
● MP-XYLENE 9 ppb
● O-XYLENE 8 ppb
1412 026-001 MW 15'-17' 10 g
● E-BENZENE 6 ppb
● MP-XYLENE 13 ppb
1423 100 PPB BTX STD

	CAH
BENZENE	100 ppb
TOLUENE	96 ppb
E-BENZENE	106 ppb
MP-XYLENE	216 ppb
O-XYLENE	115 ppb
	100 ppb
	100 ppb
	100 ppb
	200 ppb
	100 ppb

J. Byrd

5 MAY 95

(15)

1435 AIR BLANK

● Toluene 1 ppb

1445 026-001 MW 20'-22' 10g

● Toluene 2 ppb

● E-Benzene 1 ppb

● MP-Xylene 4 ppb

1456 026-001 MW 24'-26' 10g

● Toluene 2 ppb

● E-Benzene 1 ppb

● MP-Xylene 3 ppb

WAITING ON MORE SAMPLES.

1525 KP is here. There are no

more samples for today.

~~start down G-53~~

1536 100 PPB BTX STD

● Benzene 84 ppb

● Toluene 90 ppb

● E-Benzene 102 ppb

● MP-Xylene 215 ppb

● O-Xylene 174 ppb

1548 SHUT DOWN GC.

Go to B247 to AIDE in

Setup for tomorrow

Thyler

5 MAY 95

16

1615 Leave base. Go to store to
get supplies
1641 At hotel

[A large wavy line, possibly representing a signature or a decorative element.]

10.4 hr

[Handwritten signature or initials.]

$$\begin{array}{r} 16.7 \\ 6.3 \\ \hline 10.4 \end{array}$$

[Handwritten signature or initials.]

DAY 5

17

SATURDAY 6 MAY 95

0545 Leave hotel
Breakfast (0.6)

0640 On base

Load vehicles for Field
0650 CALIBRATE BOTH PIDS to
100 PPM ISOBUTYLENE

0718 Go to site 26

0721 Set up. for drilling
Waiting on drillers

0748 Drillers here.

0808 Safety Meeting

SB, DG, KP, KM, Jamie, Wolf

• Trapping

• Don't eat dirt

• Rt. to hospital.

0810 Drilling start

1105 Leave Site 26. Go to B252

1110 At B252.

Begin GC set-up.

Build 10 PPM ATCX STD.

1200 Rig is disconnected. Ready to back
to site 26.

J. Byrnes

6 MAY 95

(18)

1211 AT 5.42 26.

Get ready to drill LAST MW

1345 60% B252. Continue

GIC Setup & STD

Building 100 PPA & 1 PPM

GAIN

1000

CARRIER GAS FLOW

12 μ l/min

INJECTION VOL

100 μ l

GC OVEN TEMP

40°C

ANALYSIS TIME

450 sec

1404 100 PPA BTEX STD

Good Run. Set LIBRARY

1422 1 PPM BTEX STD

1425 60% Front Gate to hand-off

Geo-Tech samples

1430 samples are handed off

1435 Back at B252.

Good Run. Set LIBRARY.

1441 10 PPM BTEX STD.

Good Run. Set LIBRARY

1456 AIR BLANK

● BENZENE

4 ppb

● TOLUENE

3 ppb

● E-BENZENE

8 ppb

J. Byrd

6 MAY 95

19

1507	026-003MW	0.5'-2.5'	10g
	● MP-Xylene		21 ppb
	● Benzene		5 ppb
	● Toluene		4 ppb
	● E-Benzene		6 ppb
	● MP-Xylene		26 ppb
	● O-Xylene		5 ppb
1518	026-003MW	5'-7'	10g
	● Benzene		3 ppb
	● Toluene		3 ppb
	● E-Benzene		10 ppb
	● MP-Xylene		25 ppb
	● O-Xylene		27 ppb
1529	026-003MW	10'-12'	10g
	● Benzene		3 ppb
	● Toluene		3 ppb
	● E-Benzene		11 ppb
	● MP-Xylene		32 ppb
	● O-Xylene		28 ppb
1540	026-002MW	0.5'-2.5'	10g
	● Toluene		3 ppb
	● E-Benzene		12 ppb
	● MP-Xylene		31 ppb
	● O-Xylene		32 ppb

gibson

6 MAY 1995

(20)

1551 026-002MW 5'-7' 10g
● Toluene 2 ppb
● E-Benzene 3 ppb
● MP-Xylene 15 ppb
● O-Xylene 17 ppb

1602 100 PPB BTEX STD	CAL
BENZENE	100 ppb
TOLUENE	100 ppb
E-BENZENE	100 ppb
MP-XYLENE	200 ppb
O-XYLENE	100 ppb

1616 AIR BLANK
● Toluene 1 ppb
1627 026-002MW 10'-12' 10g
● BENZENE 1 ppb
● Toluene 3 ppb
● E-Benzene 3 ppb
● MP-Xylene 9 ppb
● O-Xylene 7 ppb
1638 026-002MW 15'-17' 10g
● BENZENE 3 ppb
● Toluene 3 ppb

J. B. [signature]

6 MAY 95

(21)

● ET-BENZENE

● MP-XYLENE

● O-XYLENE

1649 100 PPB BTX STD

* BENZENE

* TOLUENE

* A-BENZENE

* MP-XYLENE

* O-XYLENE

1659 Shut down GC.

1705 Leave base

1723 At hotel

2 ppb

7 ppb

4 ppb

100 ppb

94 ppb

91 ppb

185 ppb

97 ppb

17.4
6.3
11.1

11.1 hrs

J. Byrd

DAY 7

22

MONDAY 8 MAY 1995

0545 Leave hotel
Breakfast (0.6)

0645 ON BASE

0650 Goto B252. Calibrate
PID to 100 PPM Iso-butane
& LEL to 50% Pentane

-- Both PIDs were left on
over the weekend. 100%
no charge on either one.

0700 Check equipment, get bottle
& brass sleeve counts.

ORGANIZE stuff.

0810 Goto B252. Set up D.G. on
GC. He will do daily prep &
set-up today

0815 CALL SPL to order ice chests
& bottles.

-- Talk to KAREN.

0830 CALL OPTECH. Talk to M. E. COBBAR
about LAs. Get P.O.# from
A. Kobchenko.

0850 CALL Enviro. Inst. But it is
0700 in California.

J. Byrd

5.7
1.1
6.8

8 MAY 95

(23)

0900 Monitor & Gateway as he
Programs GC. and Builds
10 PPM, 1 PPM, & 100 PPM
BTEX STDs

0954 100 PPM BTEX STD.

Missed shot.

1010 100 PPM BTEX STD.

Good Run. Set Library.

1029 1 PPM BTEX STD

Good Run. Set Library

1045 10 PPM BTEX STD.

Good Run. Set Library

1059 AIR BLANK

● Benzene

● Toluene

● Ethylbenzene

● MP-Xylene

● O-Xylene

-- Unusually high readings.

1113 AIR BLANK

● Benzene

● Toluene

● E-Benzene

● MP-Xylene

12 PPM

30 PPM

79 PPM

155 PPM

76 PPM

5 PPM

16 PPM

41 PPM

92 PPM

g. Byrd

18 MAY 95

(24)

● O-Xylene 185 ppb.
-- Printer malfunction. need to
reprint.

1132 KP-KM-DG go to lunch.
Lunch (0.5)

1200 AIR BLANK.

● BENZENE 2 ppb
● Toluene 8 ppb
● E-BENZENE 7 ppb
● MP-XYLENE 13 ppb
● O-XYLENE 14 ppb

1213 Methanol (500ul injection) (-5)
● BENZENE 12 ppb → 2 ppb
● Toluene 22 ppb → 4 ppb
● E-BENZENE 6 ppb → 1 ppb
● MP-XYLENE 9 ppb → 2 ppb

1225 Goto B247 got. set up
Decom stuff to clean
brass sleeves.

1235 KP-KM-DG RETURN.
Goto B252 to continue GC.
They have soil from this AM.

J. Byrd

18 MAY 95

(25)

1256 026-002 MW 200'-220' 10g
 ● Benzene 4 ppb
 ● Toluene 6 ppb
 ● E-Benzene 7 ppb
 ● MP-Xylene 13 ppb
 ● O-Xylene 11 ppb

1307 100 PPB BTEX STD

	99	80	72	133	47	CAL
Benzene	ppb	ppb	ppb	ppb	ppb	ppb
Toluene	ppb	ppb	ppb	ppb	ppb	ppb
E-Benzene	ppb	ppb	ppb	ppb	ppb	ppb
MP-Xylene	ppb	ppb	ppb	ppb	ppb	ppb
O-Xylene	ppb	ppb	ppb	ppb	ppb	ppb

1319 Shut down GC.

Go to 0247 & continue decon of brass sleeves

Set-up equipment for tomorrow.
 1500 Meet w/ B Berg.

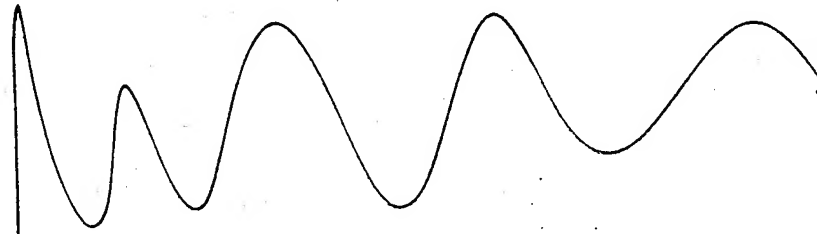
He ok's ALL sites at 25-
 for tomorrow's drilling
 that 025-001 MW. It is
 moved 8'-10' south.

J. D. Berg

(26)

8 MAY 95

1515 KM-KP are back
Discuss schedule.
1530 Leave base
1540 At Hotel



spiky 4R

9.0 hrs

$$\begin{array}{r} 15.8 \\ 6.8 \\ \hline 9.0 \end{array}$$

~~DL~~

DAY 8

(27)

TUESDAY 9 MAY 1995

0600 LEAVE hotel

Breakfast (0.7)

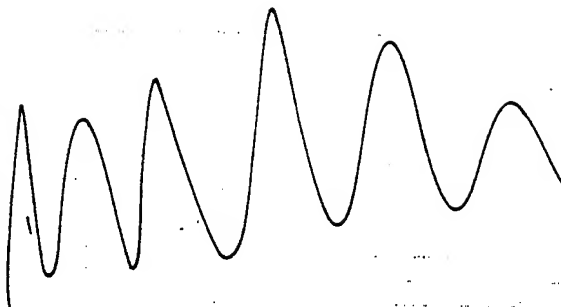
0700 ON BASE

--- Weather: 40's (lo)
RAINING HARDNO JOB RELATED ACTIVITIES
Today due to weather

0740 LEAVE BASE

FUEL CAR.

0800 AT hotel



J. Byrd

1.3 hr.

DAY 9

(28)

WEDNESDAY

10 MAY 1995

0545 Leave hotel

BREAKFAST (0.6)

0645 On Base

0650 CALIBRATE BOTH PIDs to

100 PPM T50 battery level.

0710 Set-up on 025-001MW

Decon equipment

0730 Driller on site

0810 Safety meeting

• JB, DG, KV, KM, Jamie, Jon

• Kill switches

• TRAFFIC AREA

• Eye, toe protection

0815 Go calibrate pH, Temp. and, L

Turbidity meter.

0850 Goto store to get batteries for

LEL

0905 Back on base. Comb. in Cal. base

0930 Gary is here. Goto Site 26.

0943 on Site. Set-up & Decon

equipment.

Set-up on 026-001MW

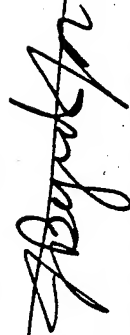
FB

5.7
1.1
6.8

(29)

10 MAY 95

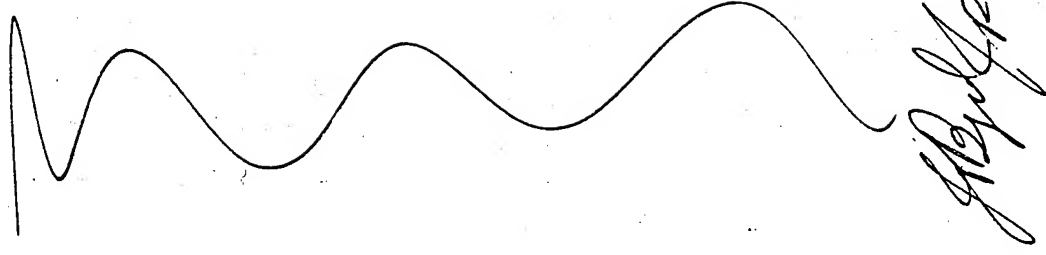
- 1205 Done w/ 026-001MW
CALL SP For escort off
Flight Line
- 1217 Drilling crew @ Launch.
- 1220 Leave Base for Launch (0.5)
- 1250 ON BASE.
Meet w/ KP. We need
to continue development of
026-001MW for 1 more hour.
- 1305 CALL SECURITY for escort.
Go to Site 26.
Continue w/ development of
026-001MW
- 1447 2-hr time table is done. Rig
down equipment, decon, and move
to 026-002MW & set up.
- 1710 Done @ 026-002MW
from developed 30 well volume
BREAK down & move to
026-003MW
- 1711 KP-KM-DG on Site. Will
develop 026-003MW on Friday.
- 1748 Leave Site 26.



10 May 95

(30)

Play in PIDs for charging
1757 leave base
1818 At hotel



11.5 hrs

JPB

7'
18.3
6.8
11.5

JPB

DAY 10

(31)

THURSDAY

11 MAY 1995

0545 Leave hotel

Breakfast (0.6)

0640 On Base

Prep truck for day.

CALIBRATE PID w/ 100

PPM Iso Butylene.

0700 START-up & Program, &

Baild 80 PPM, 1 PPM, and

100 PPB BTEX STDs.

0731 Goto Safety Mtg

SB, DG, KP, KM, JAMIE, Jonathan

• Sunscreen

• PPE

• Be safe

• Tripping.

0740 Continue GC set-up.

0754 100 PPB BTEX STD.

Good Picture. Set LIBRARY

0810 1 PPM BTEX STD

Good Run. Set LIBRARY.

0824 10 PPM BTEX STD

Good Run. Set LIBRARY

JL Synge

5.7
1.3
7.0

11 MAY 95

32

0837 AIR BLANK

● BENZENE 8 ppb
● TOLUENE 18 ppb
● E-BENZENE 22 ppb
● MP-XYLENE 51 ppb
● O-XYLENE 21 ppb

0847 025-001 MW 0.5'-2.5' 10g

● BENZENE 6 ppb
● TOLUENE 6 ppb
● E-BENZENE 8 ppb
● MP-XYLENE 18 ppb

0857 025-001 MW 5'-7' 10g

● BENZENE 1 ppb
● TOLUENE 4 ppb
● E-BENZENE 8 ppb
● MP-XYLENE 21 ppb

0907 025-001 MW 10'-12' 10g

● BENZENE 2 ppb
● TOLUENE 4 ppb
● E-BENZENE 13 ppb
● MP-XYLENE 19 ppb

0917 025-001 MW 15'-17' 10g

● BENZENE 1 ppb
● TOLUENE 4 ppb

J. B. Doyle

11 MAY 95

33

● E-Benzene 3 ppb
 ● MP-Xylene 11 ppb
 0928 025-001 MW 20'-22' 10g
 ● Benzene 1 ppb
 ● Toluene 4 ppb
 ● E-Benzene 3 ppb
 ● MP-Xylene 8 ppb

0938 100 PPB BTEX STD CAL
 Benzene 91 ppb 100 ppb
 Toluene 87 ppb 100 ppb
 E-Benzene 89 ppb 100 ppb
 MP-Xylene 193 ppb 200 ppb
 O-Xylene 87 ppb 100 ppb

0950 AIR BLANK
 ● Toluene 2 ppb
 ● E-Benzene 2 ppb
 1002 025-001 MW 25'-27' 10g
 ● Benzene 3 ppb
 ● Toluene 4 ppb
 ● E-Benzene 2 ppb
 ● MP-Xylene 5 ppb

J. Byrd

11 MAY 95

34

1012 025-001MW 30'-32' 10g
 ● Benzene 3 ppb
 ● Toluene 4 ppb
 ● E-Benzene 5 ppb
 ● MP-Xylene 9 ppb

1022 025-001MW 35'-37' 10g
 ● Toluene 4 ppb
 ● E-Benzene 18 ppb
 ● MP-Xylene 29 ppb

1032 025-002MW 0.5'-2.5' 10g
 ● Toluene 4 ppb
 ● E-Benzene 2 ppb
 ● MP-Xylene 7 ppb

1042 025-002MW 5'-7' 10g
 ● Benzene 3 ppb
 ● Toluene 4 ppb
 ● E-Benzene 1 ppb
 ● MP-Xylene 3 ppb

1052 100 PPB BTX STD

CAH

Benzene	108	1ppb	1ppb
Toluene	104	1ppb	1ppb
E-Benzene	104	1ppb	1ppb
MP-Xylene	212	1ppb	1ppb
O-Xylene	108	1ppb	1ppb

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11 MAY 95

(35)

1108 Goto lunch (0.7)
1151 At Site 17 too walk size
1210 ON BASE
1226 AIR BLANK

● Toluene 1 ppb
● E-BENZENE 1 ppb

1241 025-002MW 10'-12' 10g

● BENZENE 4 ppb
● Toluene 4 ppb
● E-BENZENE 2 ppb
● MP-Xylene 7 ppb
● O-Xylene 4 ppb

1252 025-002MW 15'-17' 10g

● Toluene 4 ppb
● E-BENZENE 1 ppb
● MP-Xylene 4 ppb
● O-Xylene 3 ppb

1305 Out of samples. Goto site 25
to get more.

1404 BACK @ GC
Prep. Sample

J. Rydzka

11 MAY 95

(36)

1407 100 PPB BTEX STD

	CAV
BENZENE	86 ppb
TOLUENE	85 ppb
E-BENZENE	81 ppb
MP-XYLENE	166 ppb
OP-XYLENE	83 ppb
	100 ppb
	100 ppb
	100 ppb
	200 ppb
	100 ppb

1421 AIR BLANK

● Toluene	1 ppb
● MP-XYLENE	27 ppb
1431 025-003MW	0.5'-2.5'
● Toluene	5 ppb
● E-BENZENE	3 ppb
● MP-XYLENE	13 ppb
● OP-XYLENE	9 ppb
1441 025-003MW	5'-7'
● Benzene	10g
● Toluene	25 ppb
● E-BENZENE	4 ppb
● MP-XYLENE	2 ppb
1451 025-003MW	10'-12'
● BENZENE	15 ppb
● Toluene	10g
	774 ppb
	350 ppb

[Handwritten signature]

[Handwritten signature]

11 MAY 95

(37)

● E-Benzene	297 ppb
● MP-Xylene	1,838 ppb
● O-Xylene	827 ppb
1511 025-003MW 10'-12'	10g (-5x)
● Benzene	133 ppb
● Toluene	103 ppb
● E-Benzene	108 ppb
● MP-Xylene	443 ppb
● O-Xylene	197 ppb
1531 025-003MW 15'-17'	10g (-10x)
● Benzene	222
● Toluene	14
● E-Benzene	ND
● MP-Xylene	ND
● O-Xylene	ND

INJECTION
20ul
10ul

1545 1 PPM BTX STD

	CA6
Benzene	696 ppb
Toluene	679 ppb
E-Benzene	658 ppb
MP-Xylene	1,389 ppb
O-Xylene	586 ppb
	1,000 ppb
	1,000 ppb
	1,000 ppb
	2,000 ppb
	1,000 ppb

J. B. [Signature]

11 MAY 95

38

1601 AIR BLANK

● Toluene

● E-BENZENE

● MP-XYLENE

1612 025-003 MW 20'-22' 10g

● BENZENE

● Toluene

● E-BENZENE

● MP-XYLENE

● O-XYLENE

1627 AIR BLANK

● Toluene

● E-BENZENE

● MP-XYLENE

1638 Shut down GC.

1648 LEAVE BASE

1705 AT HOTEL

1 ppb

1 ppb

3 ppb

10g

149 ppb

15 ppb

9 ppb

25 ppb

16 ppb

1 ppb

1 ppb

2 ppb

10.1 hr

17.1
7.0
10.1

[Signature]

[Wavy line]

[Signature]

DAY 11

(39)

FRIDAY MAY 12 1995

0545 Leave hotel

Breakfast (0.7

0645 On base

CALIBRATE PIDS & Hydac
meter.

0710 Call security for escort to
Site 26.

0717 On site. Set up for development
of 026-003MW

0940 Done. Call security for
escort. Waiting for F-16 to
leave hanger.

0951 Off site 26. Go to BZ47
to decon for development
of 025-001MW.

1020 At 025-001 MW.

1236 Done
Decon equipment. Move to
025-002 MW

1510 Done. Decon & Go to
025-003 MW.

1735 Done. Decon equipment

[Signature]

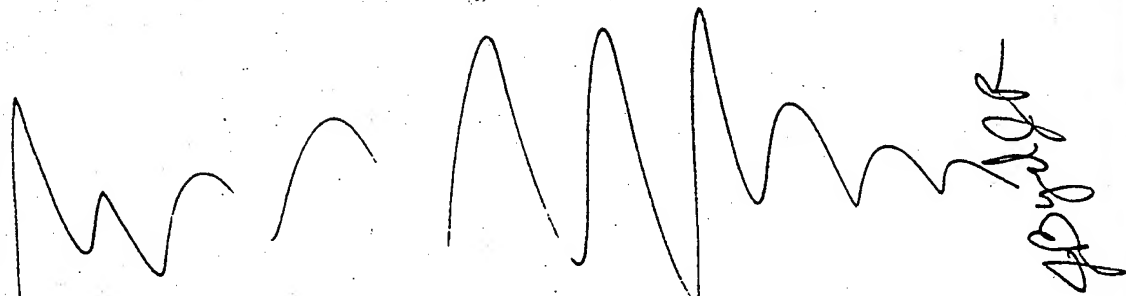
5.7
- .7

6.4

40

12 MAY 75

1750 LEAVE BASE
1805 AT HOTEL



11.7 hr

7.
18.1
6.4

11.7

[Handwritten signature]

DAY 12

(41)

SATURDAY 13 MAY 1995

0730 LEAVE HOTEL

BREAKFAST (0.3)

0810 ON BASE

Set-up GC. Build 10 PPM,
1 PPM, 100 PPB BTX STDs.

GAIN

1,000

CARRIER GAS FLOW

14 ml/min

INJECTION VOL

100 μ l

GC OVEN TEMP

40°C

ANALYSIS TIME

400 sec

0848 100 PPB BTX STD

Good Run. Set Library

0904 1 PPM BTX STD

Good Run. Set Library

0918 10 PPM BTX STD.

Good Run. Set Library

0931 AIR BLANK

0931

• Benzene

4 ppb

• Toluene

3 ppb

• E-Benzene

8 ppb

• MP-Xylene

14 ppb

0941 025-009BH 0.5'-2.5'

10g

• Benzene

4 ppb

J. Byrd

7.5
- .3
7.8

42

13 MAY 95

● Toluene	4 ppb
● E-Benzene	4 ppb
● MP-Xylene	9 ppb
0952 025-009BH 5'-7'	10g
● Benzene	3 ppb
● Toluene	4 ppb
● E-Benzene	3 ppb
● MP-Xylene	2 ppb
1003 025-009BH 10'-12'	10g
● Benzene	3 ppb
● Toluene	3 ppb
1013 025-011BH 0.5'-2.5'	10g
● Benzene	2 ppb
● Toluene	3 ppb
● E-Benzene	1 ppb
● MP-Xylene	4 ppb
1023 025-011BH 5'-7'	10g
● Toluene	4 ppb
● E-Benzene	2 ppb
● MP-Xylene	5 ppb

4/3/95

13 MAY 95

43

1033 100 PPA BTX STD

	CAH
Benzene	106 ppb
Toluene	100 ppb
E-Benzene	101 ppb
MP-Xylene	207 ppb
O-Xylene	99 ppb

1043 AIR BLANK

- Toluene
- MP-Xylene

1 ppb
3 ppb
10g
3 ppb
1 ppb
3 ppb
20g
72 ppb
184 ppb
1,270 ppb
1,290 ppb
18,900 ppb
20g
7 ppb

1054 025-008BH 05'-25'

- Toluene
- E-Benzene
- MP-Xylene

1104 025-008BH 7'-9'

- Benzene
- Toluene
- E-Benzene
- MP-Xylene
- O-Xylene

1121 025-008BH 7'-9'

- 10ul injection
- Benzene

J. Byrd

13 MAY 95

(44)

- Toluene
- E-Benzene
- MP-Xylene
- O-Xylene

22 ppb
126 ppb
158 ppb
806 ppb

1136 025-008BH 9'-11'

--- 10 microliter injection

- ALL ND's

1147 025-008BH 9'-11'

--- Reshot 50ul injection

- Benzene
- Toluene
- E-Benzene
- O-Xylene

2 ppb
2 ppb
6 ppb
30 ppb

1158 100 PPB BTEX STD

	CAL	
Benzene	108 ppb	100 ppb
Toluene	95 ppb	100 ppb
E-Benzene	101 ppb	100 ppb
MP-Xylene	214 ppb	200 ppb
O-Xylene	144 ppb	100 ppb

1210 AIR BLANK

- Benzene
- Toluene

1 ppb
2 ppb

J. B. G. Jr.

13 MAY 95

45

● E-Benzene			1 ppb
● MP-Xylene			2 ppb
1221 025-008BH	13'-15'		10g
● Toluene			3 ppb
● E-Benzene			2 ppb
1231 025-010BH	0.5'-2.5'		10g
● Toluene			3 ppb
● E-Benzene			7 ppb
● MP-Xylene			17 ppb
● O-Xylene			9 ppb
1242 025-010BH	5'-7'		10g
● Benzene			3 ppb
● Toluene			3 ppb
● E-Benzene			1 ppb
● MP-Xylene			3 ppb
● O-Xylene			2 ppb
1300 025-006BH	0.5'-2.5'		10g
● Toluene			3 ppb
● E-Benzene			1 ppb
● MP-Xylene			3 ppb
● O-Xylene			1 ppb
1310 025-006BH	5'-7'		10g
● Toluene			3 ppb
● E-Benzene			1 ppb

J. B. B. B.

13 MAY 95

46

- MP-Xylene
- O-Xylene

3 ppb
1 ppb

1320 100 PPB OTEX STD

		CAL
Benzene	89 ppb	100 ppb
Toluene	97 ppb	100 ppb
E-Benzene	88 ppb	100 ppb
MP-Xylene	159 ppb	200 ppb
O-Xylene	34 ppb	100 ppb

1333 AIR BLANK

- Toluene
- MP-Xylene

12 ppb
3 ppb

~~025~~ JB

1343 025-006BH 10'-12'

- Toluene
- E-Benzene
- O-Xylene

10g
5 ppb
5 ppb
14 ppb

1353 025-006BH 20'-22'

- Benzene
- Toluene
- E-Benzene
- O-Xylene

10g
3 ppb
32 ppb
35 ppb
78 ppb

J. B. Smith

GC PROCEDURES

13 MAY 95

(47)

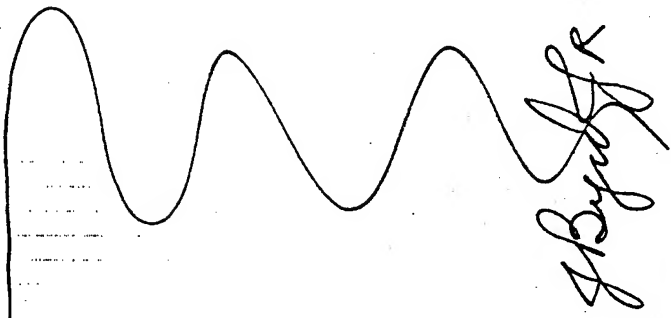
1404 100 PPB BTX STD

- Benzene
- Toluene
- E-Benzene
- MP-Xylene
- O-Xylene

93 ppb
92 ppb
96 ppb
93 ppb
101 ppb

Shut down GC.
Secure BZ52.
1420 Leave base.
1440 AT hotel

3'
14.7
7.8
6.9



6.9hr

J. Byrd Jr

4B

DAY 14

MONDAY

15 MAY 95

0545 Leave hotel. Get GAS.

Breakfast (0.3)

0645 On Base

Set-up & Program GC.

CALIBRATE BETH PLD's to

100 PPM Isobutylene

CALIBRATE GEL to 50%

Pentane.

Build 10 PPM, 1 PPM, &

100 PPB BTX STD's.



0812 100 PPB BTX STD.

Good Run. Set Library.

0839 1 PPM BTX STD.

Good Run. Set Library

0855 10 PPM BTX STD

Good Run. Set Library

0912 AIR BLANK

● Benzene

● Toluene

2 ppb
1 ppb

J. Bygones

$$\frac{5.7}{6.0} = 0.95$$

15 MAY 95

(49)

- E-Benzene
- MP-Xylene

3 ppb
4 ppb

0925 Goto Site to get samples.
0930 Safety Meeting

- JB, Kl, KM, DG, JAMIE, JON
- WEATHER - chance of rain?
- PPE

● Don't eat Diet.

0935 HAVE not begun yet. Goto Site 17 to meet w/ people to get underground clearances
1023 Person from Gopher 1 here. He had been here earlier to check site for dailers. He is from the City of Duluth.

1045 HAVE given anybody else 30 min. Return to base.
1051 on base gather samples.
Prep. samples

too p ~~100~~

1103 1 PPM BTX STD. CAL

- Benzene 827 ppb 1,000 ppb
- Toluene 778 ppb 1,000 ppb
- E-Benzene 664 ppb 1,000 ppb

J. Byrnes

$$\begin{array}{r} 10.9 \\ 9.6 \\ \hline 1.3 \end{array}$$

15 MAY 95

50

MP-Xylene 1300 ppb 2,000 ppb
O-Xylene 632 ppb 1,000 ppb

1117 AIR BLANK

● Benzene
● Toluene
● E-Benzene
● MP-Xylene

1 ppb
2 ppb
3 ppb
3 ppb

1127 025-003BH 0.5'-2.5'

● Benzene
● Toluene
● E-Benzene
● O-Xylene

10g
7 ppb
10 ppb
41 ppb
82 ppb

1137 025-003BH 5'-7'

● E-Benzene
● MP-Xylene
● O-Xylene

10g
3,620 ppb
35,650 ppb
15,050 ppb

1149 025-003BH 5'-7' 10g Reshot
--- 10ul injection

● ALL NDS

● JLB

● JLB

1201 025-003BH 5'-7' 10g

--- 20ul injection
ReReshot

JLB

15 MAY 95

51

- Toluene 4,790 ppb
- E-Benzene 747 ppb
- MP-Xylene 2,740 ppb
- O-Xylene 4,030 ppb

1215 025-003BH 10'-12' 10g

--- 20ul injection

- Toluene 9,510 ppb
- E-Benzene 1,040 ppb
- MP-Xylene 7,290 ppb
- O-Xylene 5,400 ppb

1229 10 PPM BTEX STD

CAL

Benzene	8,720 ppb	10,000 ppb
Toluene	8,470 ppb	10,000 ppb
E-Benzene	5,510 ppb	10,000 ppb
MP-Xylene	11,620 ppb	20,000 ppb
O-Xylene	5,810 ppb	10,000 ppb

1243 AIR BLANK

- Benzene 11 ppb
- Toluene 5 ppb
- E-Benzene 11 ppb
- MP-Xylene 25 ppb

--- JB ---

flydfr

15 MAY 95

52

GC PROCEDURES

1255 025-003BH 15'-17' 10g
--- 20 μ l injection
● Benzene 28 ppb
● Toluene 43 ppb
● E-Benzene 41 ppb
● MP-Xylene 228 ppb
● O-Xylene 84 ppb

1306 025-003BH 20'-22' 10g
--- 50 μ l injection
● Benzene 138 ppb
● Toluene 157 ppb
● E-Benzene 123 ppb
● MP-Xylene 916 ppb
● O-Xylene 553 ppb

1317 GoLo Rig to get more samples

1339 025-003BH 25' 10g

--- 20 μ l injection
● ALL ND's (NO READ-OUT)

1351 025-003BH 25' 10g Reshot

--- 100 μ l injection
● Benzene 20 ppb
● Toluene 276 ppb
● E-Benzene 42 ppb

gbygk

GC PROCEDURES

53

15 MAY 95

• MP-Xylene 364 ppb
 • O-Xylene 47 ppb
 1402 025-002BH 0.5'-2.5' 10g
 • Benzene 13 ppb
 • Toluene 152 ppb
 • E-BENZENE 12 ppb
 • MP-Xylene 31 ppb
 1418 1 PPM BTX

	CAV
Benzene	900 ppb 1,000 ppb
Toluene	828 ppb 1,000 ppb
E-Benzene	718 ppb 1,000 ppb
MP-Xylene	1,440 ppb 2,000 ppb
O-Xylene	824 ppb 1,000 ppb

1432 AIR BLANK
 • Toluene 2 ppb
 • E-Benzene 3 ppb
 • MP-Xylene 6 ppb
 1442 025-002BH 5'-7' 50ul inject 10g
 • SNOT messed up
 1454 025-002BH 5'-7' 10g
 --- 30ul injection
 • Benzene 1,160,000 ppb

[Signature]

15 MAY 95

54

- Toluene 52,510 ppb
- E-Benzene 5,100 ppb
- MP-Xylene 41,000 ppb
- O-Xylene 22,700 ppb

1505 goto site to talk to KP
about concentrations.

1541 025-002BH 5'-7' 10g
--- 5ul injection

- Benzene 1,010 ppb
- Toluene 10,700 ppb
- E-Benzene 135 ppb
- MP-Xylene 7,810 ppb
- O-Xylene 5,190 ppb

1557 025-002BH 5'-7' 10g

--- 5ul injection --- Re-Reshot

- Benzene 3,690 ppb
- Toluene 10,450 ppb
- E-Benzene 168 ppb
- MP-Xylene 7,230 ppb
- O-Xylene 4,650 ppb

1613 goto site to get samples.
Prep. Samples

J. Byrd

15 MAY 95

55

1638 10 PPM BTEX STD

	CAL
Benzene	9,050 ppb
Toluene	8,790 ppb
E-Benzene	8,290 ppb
MP-Xylene	16,840 ppb
O-Xylene	8,390 ppb
	10,000 ppb
	10,000 ppb
	10,000 ppb
	20,000 ppb
	10,000 ppb

1652 AIR BLANK

- Benzene 11 ppb
 - Toluene 38 ppb
 - E-Benzene 41 ppb
 - MP-Xylene 521 ppb
 - O-Xylene 103 ppb
- (400ul injection)

1702 AIR BLANK

- Benzene 10 ppb
- Toluene 14 ppb
- E-Benzene 4 ppb
- MP-Xylene 13 ppb

1713 025-001 BH 05-25'

--- 50ul injections

- Benzene 10-3 ppb
- Toluene 32-3 ppb-31 ppb
- E-Benzene 4 ppb

JB 6/2

15 MAY 95

56

● MP-Xylene 16 ppb

1723 025-001BH 5'-7' 3g

● Benzene JB

● Toluene 18,380 ppb

● E-Benzene 190 ppb

● MP-Xylene 11,620 ppb

● O-Xylene 5,410 ppb

1736 10 PPM BTEX STD

● Benzene 10,940 ppb

● Toluene 9,800 ppb

● E-Benzene 8,540 ppb

● MP-Xylene 16,560 ppb

● O-Xylene 7,750 ppb

Shut down GC.

Secure B252

1754 leave base

1816 At Hotel

1.3 - 213

11.0 - 197

12.3hr

[Signature]

18.3
6.0
12.3

DAY 15

57

TUESDAY 16 MAY 95

0545 leave hotel
Breakfast (0.6)
0845 on Base

PROGRAM GC. Build 10 PPM,
1 PPM, & 100 PPB BTX STDs.
100 PPB BTX IS.

GAIN 1000
CARRIER GAS FLOW 13.400 11.3 $\frac{1}{2}$ l/min
INJECTION VOL. 100 μ l
GC OVEN Temp 40 °C
ANALYSIS Time 45.0
35.500 sec

0803 100 PPB BTX STD.

Good Run. Set Library

0820 1 PPM BTX STD.

Good Run. Set Library

0834 10 PPM BTX STD

Good Run. Set Library

0850 AIR BLANK

● Toluene 9 ppb
● E-Benzene 5 ppb
● m-p-xylene 6 ppb

0900 Goto Site to get samples.
Prepare Samples

J. S. Ziegler

5.7
1.6
7.3

[Handwritten signature]

16 MAY 95

(58)

0923	025-007BH	0.5'-2.5'	10g
	● Benzene		2 ppb
	● Toluene		6 ppb
	● E-Benzene		1 ppb
	● MP-Xylene		3 ppb
0935	025-007BH	5'-7'	10g
	● Benzene		5 ppb
	● Toluene		12 ppb
	● E-Benzene		5 ppb
	● MP-Xylene		14 ppb
0946	025-007BH	10'-12'	10g
	● Benzene		4 ppb
	● Toluene		4 ppb
0957	025-007BH	15'-17'	10g
	● Benzene		4 ppb
	● Toluene		11 ppb
	● E-Benzene		1 ppb
1008	025-007BH	20'-22'	10g
	● Toluene		4 ppb
	● E-Benzene		1 ppb
	● E-Benzene		1 ppb
1019	100 PPB BTEX STD		
	Benzene	101 ppb	100 ppb
	Toluene	83 ppb	100 ppb
	E-Benzene	54 ppb	100 ppb

JB

⑤

[illegible]

5996

0.5-2.5'

● Benzene

4 Feb

99b

121-01

4000

2 ppb

20'22'

3460

4006

981

9 11 12

1118 60 to 5, to get samples.

Prepare samples

102

4 000

1-5-7

200b

406

2/2/84

16 MAY 95

60

- E-Benzene
- MP-Xylene
- O-Xylene

10 ppb
178 ppb
157 ppb

1208 bench (1.0 hr)
1308 Back on base.
Prep Samples.

1331 100 PPB BTEX STD

BENZENE
TOLUENE
E-BENZENE
MP-Xylene
O-Xylene

88 ppb
87 ppb
58 ppb
78 ppb
0 ppb

~~100 ppb
100 ppb
100 ppb
100 ppb
100 ppb~~

Go to rig to help them set
up & move.

1415 100 PPB BTEX

----- STAND AHEAD IS FLAT.
Rebuild 1 PPM & 100 PPB

BTEX STDs.

1439 ERASE LIBRARY

1442 100 PPB BTEX STD.

--- NO O-Xylene PEAK.

Reset CARRIER GAS Flow to
12 ul/min

[Signature]

16 MAY 95

(61)

1530 100 PPB BTEX STD
Good Run. Set Library.

1548 1 PPM BTEX STD.

Good Run. Set Library.

1602 10 PPM BTEX STD.

Good Run. Set Library.

1617 AIR BLANK

● Benzene	1 ppb		10g
● Toluene	1 ppb		
● E-Benzene	6 ppb		
● mP-Xylene	9 ppb		
1630 025-004BH	10'-12'		
● Benzene	1 ppb		
● Toluene	4 ppb		
● E-Benzene	4 ppb		
● mP-Xylene	8 ppb		
1643 025-004BH	18'-20'		10g
● Benzene	1 ppb		
● Toluene	3 ppb		
1655 021-026BH	9'-10'		10g
● Benzene	1 ppb		
● Toluene	3 ppb		
1707 021-026BH	4'-6'		10g
● Benzene	1 ppb		

g. g. g. g.

16 MAY 95

(62)

● Toluene 2 ppb
 ● E-Benzene 4 ppb
 ● mP-Xylene 5 ppb
 1719-025-004BH 5'-7' Reshot 10g

● Benzene 1 ppb
 ● Toluene 3 ppb
 ● E-Benzene 2 ppb
 ● mP-Xylene 6 ppb
 1731 100 PPB BTEX STD

● Benzene 106 ppb
 ● Toluene 103 ppb
 ● E-Benzene 98 ppb
 ● mP-Xylene 188 ppb
 ● O-Xylene 68 ppb

Shut down GC
 Secure B252
 Secure B247
 1748 Leave base
 1805 At Hotel

7.1
 18.1
 7.3
 10.8

213
 0.5
 197
 10.3
 10.8 hrs.

[Signature]

DAY 16

WEDNESDAY 17 MAY 75

(63)

GC PROCEDURES

0545 leave hotel
Breakfast (0.5)

0635 on base

Set up & Program GC.
Build 10 PPM, 1 PPM, &
100 PPB BTX STDs.

GAIN

1,000

CARRIER GAS FLOW

12 ml/min

INJECTION VOL

100 µl

GC OVEN TEMP

40°C

ANALYSIS TIME

460 sec

0726 100 PPB BTX STD.

~~Good Run. Set Library. JB~~

NO O-Xylene. Increase Run

Time to 500 sec.

0742 100 PPB BTX STD

NO O-Xylene.

---- Adjust DRV 3 & DRV 4

to (5 + A/6)

0757 100 PPB BTX STD

Good Run. Set Library

0815 1 PPM BTX STD

Good Run. Set Library

J. B. Snyder

17 MAY 95

(64)

0830 10 PPM BTX STD

Good Run. Set Library

0845 AIR BLANK

- Benzene 1 ppb
- Toluene 12 ppb
- mP-Xylene 83 ppb
- o-Xylene 20 ppb

10g

0858 021-027BH 4'-6'

- Benzene 1 ppb
- Toluene 3 ppb
- mP-Xylene 31 ppb
- o-Xylene 11 ppb

10g

0910 021-027BH 8'-10'

- Toluene 3 ppb
- E-Benzene 3 ppb
- mP-Xylene 8 ppb
- o-Xylene 4 ppb

0921 AIR BLANK

- Benzene 2 ppb
- Toluene 1 ppb

10g

0934 021-028BH 25'-25'

- Toluene 2 ppb
- E-Benzene 2 ppb
- mP-Xylene 3 ppb


Brydfe

(65)

17 MAY 95

● O-Xylene 2 ppb
 0946 021-028BH
 ● Toluene 2 ppb
 ● E-Benzene 3 ppb
 ● MP-Xylene 5 ppb
 ● O-Xylene 5 ppb
 0958 100 PPB BTEX STD CAL

Benzene	97 ppb	100 ppb
Toluene	70 ppb	100 ppb
E-Benzene	62 ppb	100 ppb
MP-Xylene	119 ppb	200 ppb
O-Xylene	51 ppb	100 ppb

1013 AIR BLANK

● Benzene 3 ppb
 ● E-Benzene 1 ppb

1034 025-012BH 0.5'-2.5' 10g

● Benzene 3 ppb
 ● Toluene 21 ppb
 ● E-Benzene 17 ppb
 ● O-Xylene 39 ppb

1040 025-012BH 5'-7' 10g

● A lot of peaks, NO Readings

J. Bayne

17 MAY 95

(66)

1101 025-012BH 5'-7' Reshot 10g

--- 20ul INJECTION

● ALL ND'S

1112 025-012BH 10'-12' 10g

● Benzene 48 ppb

● Toluene 31 ppb

● E-BENZENE 4 ppb

● O-XYLENE 14 ppb

1124 025-012BH 18'-20' 10g

● Benzene 41 ppb

● Toluene 46 ppb

CLEAN AREA

1145 ~~400~~ 33 Goto Site 17.

1200 Lunch (1.0)

1300 At Site 17. Goto B252

1321 100 PPB BTX STD. CAL

Benzene	77	ppb	100	ppb
Toluene	84	ppb	100	ppb
E-Benzene	80	ppb	100	ppb
MP-Xylene	151	ppb	200	ppb
O-Xylene	78	ppb	100	ppb

JB

J. Byrd

(67)

17 MAY 95

1336 AIR BLANK

- Benzene 3 ppb
- E-Benzene 1 ppb
- O-Xylene 73 ppb
- 0.5-2.5'

10g

1347 0.25-0.13BH

- Benzene 4 ppb
- Toluene 3 ppb
- E-Benzene 1 ppb
- MP-Xylene 3 ppb

10g

1359 0.25-0.13BH

- 5'-7'
- Benzene 3 ppb
- Toluene 2 ppb
- E-Benzene 20 ppb
- O-Xylene 106 ppb

10g

1411 0.25-0.13BH

- 10'-12'
- Benzene 4 ppb
- Toluene 2 ppb
- E-Benzene 4 ppb
- MP-Xylene 2 ppb

10g

1429 0.25-0.13BH

- 18'-20'
- Benzene 10 ppb
- Toluene 17 ppb
- E-Benzene 3 ppb
- O-Xylene 4 ppb

J. Byrd

GC PROCEDURES

17 MAY 95

(68)

1441 100 PPB BTEX STD

CAL

BENZENE	96	ppb	100	ppb
Toluene	92	ppb	100	ppb
E-BENZENE	87	ppb	100	ppb
MP-XYLENE	178	ppb	200	ppb
O-XYLENE	93	ppb	100	ppb
- - - 33 - -	-	-	-	-

1509 AIR BLANK

● BENZENE 1 ppb

1521 017-024BH 0.5'-2.5' 6g

● BENZENE 1 ppb

● E-BENZENE 8 ppb

● O-XYLENE 13 ppb

1533 017-024BH 4'-6' 10g

● BENZENE 4 ppb

● Toluene 1 ppb

● MP-XYLENE 44 ppb

~~1546 017-024BH 8'-10' 33 15g~~~~● 5~~

1546 017-024BH 0.5'-2.5' 10g

● BENZENE 6 ppb

● Toluene 1 ppb

● E-BENZENE 4 ppb

Hynd

GC Procedures

17 MAY 95

(69)

1558 017-024BH 8-10 9ppb 15g

●MP-Xylene

●Benzene

●E-Benzene

●O-Xylene

1610 017-025BH 4-6 10g

●Benzene

●Toluene

●E-Benzene

1622 100 PPB BTX STD CAL

Benzene	96	ppb	100	ppb
Toluene	81	ppb	100	ppb
E-Benzene	64	ppb	100	ppb
MP-Xylene	115	ppb	200	ppb
O-Xylene	108	ppb	100	ppb

1636 AIR BLANK

●Benzene

●E-Benzene

●Toluene

●O-Xylene

1648 017-022BH 0.5-2.5 10g

●Benzene

●Toluene

Handwritten signature

17 MAY 95

(70)

● E-BENZENE	7 ppb	10g
● MP-XYLENE	12 ppb	
● O-XYLENE	1 ppb	
1659 017-0238H	0.5'-2.5'	
● BENZENE	3 ppb	
● TOLUENE	3 ppb	
● E-BENZENE	7 ppb	
● MP-XYLENE	9 ppb	
1713 017-0238H	4'-6'	10g
● BENZENE	10 ppb	
● TOLUENE	3 ppb	
● E-BENZENE	37 ppb	
● MP-XYLENE	98 ppb	
1724 017-0288H	0.5'-2.5'	10g
● BENZENE	13 ppb	
● TOLUENE	3 ppb	
● E-BENZENE	4 ppb	
1736 017-0288H	4'-6'	6g
● BENZENE	3 ppb	
● E-BENZENE	5 ppb	



Continued in Book 2



SUMMARY OF GC ANALYSIS PROCEDURE**Calibration**

Prepare 100-ppb, 1-ppm, and 10-ppm working standards (fresh each day according to the GC CALIBRATION section). Create a 3-point calibration with these three standards, according to the GC CALIBRATION and GC ANALYSIS sections. Be sure that correct standard concentration values are used for peaks representing more than one component, as recognized by the GC (e.g., 2 ppm for m,p-xylene peak).

Sample Analysis

Prepare and analyze headspace from soil and water samples according to SOIL AND WATER SAMPLE PREPARATION. All samples will be consistently warmed in the water bath before headspace injection. If sample results are significantly greater than the 10-ppm standard (e.g., greater than 60 ppm for total BTEX), then the sample must be reanalyzed with dilution as needed to bring it into range of the standard used. Diluted samples are achieved either by injecting smaller gas volumes onto the GC or using less soil in preparing the headspace sample, as detailed in the GC ANALYSIS section. After analysis of every five samples (or after a lapse in GC operation of more than 2 hours), a QA/QC check must be performed, consisting of a calibration check and an air blank check.

QA/QC Check

Perform a calibration check by analyzing an appropriate working standard again. If, after shooting a working standard, correct identification of all standard compounds and concentrations within the range of 80-120% of the specified calibration concentration is not achieved, then restore the standard compounds, peak numbers, and calibration concentrations in the library as detailed in GC CALIBRATION CHECK.

Perform an air blank check by injecting an open air sample into the GC. If the results are not "clean" (close to or less than 10 ppb for all analytes), then perform more stringent decontamination procedures on the syringe used for sample injection or evaluate whether there are significant volatiles present in the ambient air. Once a successful QA/QC check has been completed, proceed with analysis of samples again.

Data Reporting

All injections, including successful and unsuccessful QA/QC checks, must be reported on the FIELD GC DATA SUMMARY. Changes in flowrate and other GC operating parameters must also be recorded as analyses progress. All concentrations reported on the SUMMARY should be recorded with no more than three significant digits, with the last digit reported being the ppb singles digit (e.g., record 5.673 ppb as 5,670 ppb, and record 24.856 ppb as 25 ppb).

INSTRUMENT AND ASSOCIATED EQUIPMENT

- Photovac 10S+ with a dot matrix printer, electrical power cords (GC main cord and GC oven cord with wall transformer), and printer serial cable.
- Photovac-provided replacement injection port septa.
- Single stage (dual gauge) regulator with tubing, quick disconnect fitting, and tee with valve for gas syringe decontamination.

Photovac 10S+ GC SOP

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October 11, 1994

GC SETUP PROCEDURE

Location

Place the GC upwind from the drilling locations and any other nearby engine exhaust sources. The GC should also be within reach of a 110 VAC power source. Refer to Figure 1 for setting up the GC.

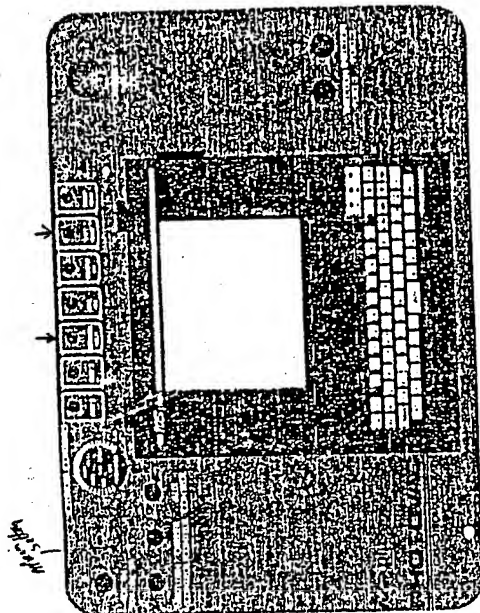


Figure 1 10S+ Top Panel.

Power & Software Loading

Connect AC line power to the 10S+ GC at the DC IN port on the upper left corner of the GC, and then turn the unit on by pressing the ON button on the computer keyboard. The 10S+ SYSTEM FUNCTION screen will be showing, with a message that a RAM card is not present. At this time, the APPLICATIONS CARD (blue with red dots) should be inserted into the lower right side of the computer, in order to load the GC software which is used for headspace analyses. Using the LOAD command, load the file GC FUNCTION (see Figure 2).

While still in the 10S+ SYSTEM FUNCTION, use the TIME/SETUP command to set the correct time and date, as shown in Figure 3. After this is correctly set, switch to the GC operation software by pressing the FCN button. The screen which appears is

Photovac 10S+ GC SOP

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- Cylinder of zero-grade compressed air for use as the carrier gas
- Photovac digital (bubble) flowmeter or Photovac dual gas rotameters. If digital flowmeter is used, a soap solution is also required.
- 2000-ppm stock standard solution of BTEX and/or other chemicals (in methanol), contained in small, 1.5-mL vials with little or no headspace.
- 10- μ L, 100- μ L, and 500- μ L gas syringes for gas headspace injection and working standard preparation.
- Electronic balance.
- 10-mL glass pipettes and rubber pipette bulb.
- 40-mL VOA vials (to prepare soil samples and working standards).
- 100% Nitrile gloves and safety glasses.
- Small ice chest for storage of samples and standards.
- Deionized water (10 mL to 10 grams of soil).
- Methanol (lab grade).
- Brush for decontamination of VOA vials.
- Small plastic tub, aquarium heater, and thermometer.
- All references herein refer to the Photovac 10S+ GC manual.

referred to as the results screen, and is titled 10S+ GC FUNCTION. This screen shows current GC operation, and the chromatogram and detected peaks of the last analysis (see Figure 4).

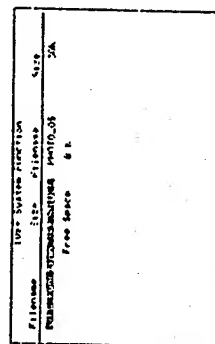


Figure 2 Loading GC Software.

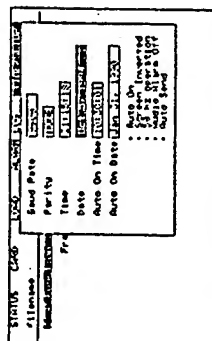


Figure 3 Setting Time and Date.

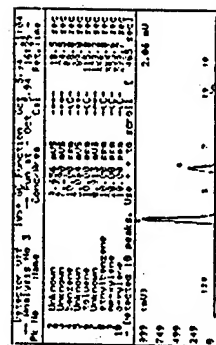


Figure 4 10S+ GC FUNCTION.

NOT: 10S+ GC VOC FUNCTION

GC SOP

October 11, 1994

Printer

Connect the dot matrix printer to the GC using the serial output cable. The cable connects to the GC at the upper right corner of the video screen. Connect AC power to the printer, turn it on and be sure it is on-line. Communication between the GC and the printer can be tested by using the PRINT SCRN key to print out a copy of the current video screen display.

Gas Cylinder

The carrier gas for the GC is provided by continuous supply through direct connection to the air cylinder. The connection of gas to the GC follows this procedure (see pages 4-6 to 4-7):

DIRECT CONNECTION TO AIR CYLINDER: Attach regulator with two pressure gauges to the air cylinder, using teflon tape on the cylinder adapter threads to insure a good seal. Attach the quick connect coupling to the CARRIER IN port on the GC. Open the valve on the cylinder several full turns, and then adjust the large valve on the regulator so that the second pressure gauge reads 40 psi. Open the small on/off valve on the regulator to supply air to the GC.

Gas Flow

The carrier gas flowrate through the GC column affects the retention time of peaks and thus the correct chemical identification of those peaks. Therefore, the accurate setting and close monitoring of the flowrate is of utmost importance. Once set, the flowrate must never be altered during a GC run. If the flowrate is altered in the midst of a series of analyses, then a recalibration must be performed to correctly reset the retention times of the components in the standard.

The carrier gas flowrate is adjusted with the use of a flowmeter provided with the instrument. The flowmeter may be either a digital bubble flowmeter (requires a dilute soap solution in the pipette bulb) or dual rotameters. Use the following procedure (refer to page 4-7):

With the dual rotameter, attach the left flowmeter to the DET OUT and the right flowmeter to the BK FLUSH OUT using the 1/8" Swagelok fittings and lines provided (see Figure 1 for location of fittings). If the digital bubble flowmeter is used, then switching the line between DET OUT and BK FLUSH OUT is required. With gas flowing to the GC, observe the flowrate readings on both of these lines. Both of these flowrates must be adjusted to the same value, in the range of 10-15 mL/min. The adjustment is made using two valves, the CARRIER CONTROL and the BK FLUSH CONTROL. These valves interact with each other, so adjustments will have to be made iteratively. Once the flowrates are set, they should not have to be changed. The DET OUT flowrates should be checked regularly during operation. After checking the flowrates, be sure the sample loop connector is reattached between the BK FLUSH OUT and SAMPLE IN ports. Completely invalid chromatograms will be obtained if this loop connector is not in place.

PID Lamp & GC Oven

The final step in setup of the 10S+ is to turn on the PID lamp and the oven. NEVER TURN ON THE PID LAMP BEFORE BEING SURE AIR IS FLOWING THROUGH THE UNIT. Turn on the lamp and oven by selecting and checking GC DETECTOR ON under the STATUS command (see Figure 5). Once this is done, lamp status will change

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GC PROGRAMMING FOR ANALYSIS

- Before carrying out analyses, certain operating parameters must be set (or their values checked) for proper and efficient operation of the GC to occur. The important parameters, their suggested values, and the command under which they are accessed are given in Table 1.

Table 1
GC Operating Parameter Values

Command	Parameter	Value
STATUS	Normalized Chromatogram	Yes (checked)
METHOD/SETUP	Detector Flow	10-15 mL/min (notation only)
METHOD/SETUP	B/F Flow	10-15 mL/min (notation only)
METHOD/SETUP	Oven Set	40-50° C
METHOD/SETUP	Gain	1.000
METHOD	Loop or Syringe	Syringe (checked)
METHOD/TIMING	Inject Volume	0.100 mL = 100 µL
METHOD/TIMING	Analysis Time	400-600 secs
METHOD/INTEGRATION	Integration	Auto (checked)
NOTES	Notepad Entry	Enter standard information, such as GC operator name, ANG Base/Station, and sample ID.

- Use the commands specified in Table 1 to set the required values, including gain, syringe injection, injection volume, analysis time, and integration method. If auto integration is selected, the window and minimum area parameters do not need to be set. If manual integration is selected, enter a window value of 10% under METHOD/INTEGRATION METHOD. When the GAIN is set to 1000 and the Normalized Chromatogram is selected, the computer will automatically select the best gain value for the current chromatogram.
- User-supplied data can be entered for record purposes using the NOTES command. This will be used to keep track of samples on ANG field projects. Simply enter the desired information using the keyboard on the computer. The following information should be entered:

<name of GC operator>
<name of National Guard Base or Station>
<monitoring well or borehole designation, depth of sample interval (feet)>

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to STARTUP AND TUNING for several minutes. If the lamp does not come on after approximately 10 minutes, then it may be overheating. Turn the whole unit off, allow to cool for 15-20 minutes, and then turn it on and try again. Once the lamp is tuned and ready, successful gas chromatograms will be obtained only if OFFSET LEVEL is less than 100.0 mV and DETECTOR VOLTAGE is greater than 300 V (under STATUS command).

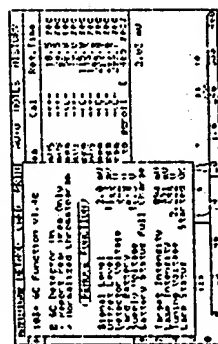


Figure 5 PID Lamp Status.

Selecting GC DETECTOR ON under the STATUS command also turns on the GC oven. The oven temperature is set by selecting the OVEN SET parameter (see Figure 6) under the METHOD/SETUP commands and entering an appropriate temperature (see page 4-2). The difference between the AMBI TEMP and the oven temperature setting can be no greater than 25 °C. 40 °C is a suitable oven temperature to select, as long as the ambient temperature is not below 15 °C (59 °F). It will take about 20 minutes to insure the oven is at constant temperature. The GC oven warmup can be monitored by viewing the OVEN TEMP versus OVEN SET values under the METHOD/SETUP command.

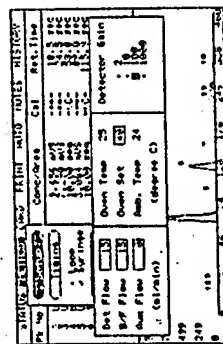


Figure 6 Setting GC Oven.

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[illegible]

GC ANALYSIS OF SAMPLES OR STANDARDS

1. Headspace from samples or working standards are analyzed on the GC to determine the presence and concentration of BTEX or other compounds of interest. Before injecting headspace from a sample or working standard into the GC, the working standard VOA vial must be warmed to room temperature. This will be accomplished by placing the VOA vial containing the standard or sample in the water bath for 15 minutes prior to vapor sample injection. The temperature of the water in this bath will be kept constant, at anywhere from 25° to 30° C, using the small aquarium heater and a thermometer.
2. To perform a GC analysis or GC run, push RUN AUTO and select SAMPLE. Take a 100- μ L or 500- μ L sample syringe and draw in 100 μ L of clean air. Insert the needle through the septa in the vial and repeatedly purge and draw 100 μ L (0.100 mL) of headspace into the syringe 10-15 times. Then draw exactly 100 μ L of headspace into the syringe.
3. Push ENTER on the GC. Now quickly extract the syringe from the working standard vial and insert it into the INJECTION PORT 1. Let the needle go down until you feel the resistance of the septa in the injection port. Once the alarm begins to sound, push the syringe through the septa and all the way down into the injection port. IMMEDIATELY after the alarm goes off, QUICKLY inject the contents of the syringe into the GC and pull the syringe out of the injection port.
4. The GC will now analyze the sample or standard. The duration of the analysis will be that time, in seconds, which was entered for ANALYSIS TIME during the GC programming steps. Peaks will appear representing the compounds in the sample. To stop the run before it is complete (e.g., if an obvious error has been made), press the RUN AUTO button. After a run is complete, the compounds detected and their concentrations will be printed in a table format above the chromatogram on the video screen.

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One method for dilution of samples for analysis is to inject a smaller volume of gas onto the GC column. For example, if the standard injection volume is 100 μL , then the injection of only 20 μL on sample headspace represents a dilution of 1 to 5. A second method of dilution is to use a mass of soil less than ten grams in preparation of the headspace sample. Thus, using a 1 gram sample would represent a dilution of 1 to 10.

7. The 500- μ L syringe is decontaminated after each sample and standard injection by removing the plunger and putting the syringe barrel onto the plastic hose coming from the tee of the air supply line. Slightly open the valve on the tee line to allow air to strip BTEX and other compounds out of the syringe barrel for several minutes.

3. The FIELD GC DATA SUMMARY form (attached to this SOP) should be used to keep track of sampling activities and results in the field. For each injection (all samples, standards, and air blanks), the following information should be entered on the form:

- The depth of the soil sample in feet, or appropriate identification of the injection.
- GC results (concentrations) of all individual analytes and of total BTEX (ppb). All concentrations should be reported in ppb, and with no more than three significant digits (last digit reported is single ppb digit).
- Actual weight of the soil determined by difference (approximately 10 grams).
- Any dilution of the sample required for analysis.

Additionally, important GC operating parameters should be recorded on the form, both initial values used and any changes made during analyses, including:

- Temperature of GC oven.
- Analysis time and gain settings.
- Carrier gas flowrate.
- Injection volume.

Finally, once the entire 3-point calibration has been initially established for the day, the response factor values (under LIBRARY STORE WINDOW (see Figure 9)) and retention times (under METHOD/LIBRARY) for each analyte should be recorded in the bottom table of the Field GC Summary Data.

GC CALIBRATION WITH HEADSPACE STANDARDS

1. Daily working standards are prepared in a clean 40-mL glass VOA vial with teflon septa following the formula below.

$$10 \text{ ppm} = \frac{SV}{10000} \times SC$$

$$C = \frac{(SV) \times SC}{(WT) \times SC}$$

$$SV = 1.0 \text{ mL}$$

Where:
 C = Working standard concentration (ppm);
 SV = Volume of stock solution (in microliters);
 WT = Volume of deionized water (in microliters) - 10,000 µL typical (10 mL); and
 SC = Stock solution concentration (ppm).

Three standards will be prepared and used each day (0.1- (100 ppb), 1.0- and 10.0-ppm standards) to create a 3-point calibration. A standard is prepared by putting 10 mL of DI water in a 40-mL VOA vial, and then adding the required amount of concentrated standard from the stock solution. Preparation of the 100-ppb standard is performed by taking liquid (not headspace) from the 1-ppm calibration standard and diluting it with 10 mL of water in a second 40-mL VOA vial. Table 2 outlines the volumes and final concentrations for these three standards (as calculated by the above formula).

Table 2
Working Standards Preparation

Working Standard Concentration	Stock Solution	Volume Taken from Stock
10 ppm	2000 ppm stock solution	50 µL
1 ppm	2000 ppm stock solution	5 µL
100 ppb	1 ppm working standard	1000 µL (1.0 mL)

Always use the appropriate syringe for dispensing very small volumes accurately (e.g., use 500-µL syringe to dispense 500 µL; use 10-µL syringe to dispense 5 µL or less). Shake the vial vigorously to mix after adding all components. Both the stock solution and working standards must always be stored inverted in a refrigerator or an ice chest. New working standards MUST be made fresh daily.

If other components are to be analyzed in addition to BTEX (such as trichloroethylene), then the 10- or 1-ppm standards are prepared by adding the specified volume (50 or 5 µL) from each separate stock solution. Never mix any separate 2000-ppm stock solutions directly together.

Analyze standards as described in the GC ANALYSIS section. An example chromatogram of a BTEX working standard is shown in Figure 8, including typical peaks for all of the components. Note that m,p-xylene is actually two components represented by one peak. If this is a 1-ppm standard, then this particular peak represents 2 ppm of those components.

If additional analytes (trichloroethylene, etc.) are being employed, the peaks are identified amongst the recognizable BTEX peaks and the order of analytes on the chromatogram

established as follows: (a) analyze standards containing each analyte separately, and compare retention times to those obtained for the BTEX standard; (b) compare the order of analytes established in (a) to the order (as given by relative retention times) given in Table 3.

Table 3
Characteristic Retention Times

Compound	Retention Times (Normalized to Benzene)			
	Ambient 20° C	30° C	40° C	50° C
Vinyl Chloride	0.288	0.306	0.361	0.413
Freon 11	0.365	0.379	0.428	0.448
Methylene Chloride	0.475	0.489	0.539	0.585
trans-1,2-Dichloroethylene	0.517	0.529	0.563	0.580
1,1-Dichloroethane	0.550	0.557	0.611	0.669
Chloroform	0.715	0.720	0.742	0.752
1,2-Dichloroethane	0.840	0.851	0.868	0.872
1,1,1-Trichloroethane	0.948	0.950	0.959	1.000
Benzene	1.000	1.000	1.000	1.000
Carbon Tetrachloride	1.095	1.050	1.048	1.086
1,2-Dichloropropane	1.266	1.254	1.214	1.192
Trichloroethylene	1.413	1.396	1.342	1.361
2-Chloroethyl Vinyl Ether	1.667	1.644	1.551	1.539
1,1,2-Trichloroethane	2.293	2.211	1.976	1.860
Toluene	2.693	2.621	2.358	2.339
Tetrachloroethylene	3.985	3.853	3.514	3.272
Chlorobenzene	5.153	4.962	4.448	4.076
Ethyl Benzene	6.223	5.985	4.882	4.743
Bromobenzene	6.282	5.261	4.713	4.351
m-xylene	6.767	6.490	5.247	5.071
o-xylene	8.145	7.826	6.234	5.979
1,1,2,2-Tetrachloroethane	8.311	7.190	5.943	5.345

4. The ANALYSIS TIME, DRV3, and DRV4 times can be adjusted to obtain a suitable chromatogram of the working standard, if one like that in Figure 8 is not initially obtained. If the chromatogram does not show any of the last peaks (xylenes or ethylbenzene), the following adjustments should be made in order. After each adjustment, reinject a headspace sample of the working standard and watch for the latter peaks to appear on the new chromatogram.

- Adjustment I. Increase ANALYSIS TIME, to 600 or 700 seconds. As an alternative, carefully adjust the carrier gas flowrate upwards to 1.5 mL/min.
- Adjustment II. Adjust the DRV3 and DRV4 off times (under METHOD/TIMING/CONFIG command) to the formula $5 + A/6$ (A represents the analysis time).

5. The 3-point calibration is initially created by analyzing the three standards in succession, starting with the lowest concentration, and storing the calibration information (using METHOD/LIBRARY/STORE) for each analyte after each chromatogram is obtained. The process is performed as follows: select METHOD/LIBRARY, select STORE, press ENTER for each compound you wish to store, then fill in the appropriate entries in the LIBRARY STORE WINDOW (peak #, compound name, and Conc.) for each compound (see Figure 9). THIS PROCESS CAN BE SUCCESSFULLY COMPLETED ONLY AFTER THE CHROMATOGRAPHIC ANALYSIS OF A WORKING STANDARD APPEARS IN THE RESULTS WINDOW. The 100-ppb standard is entered as Conc. 1 (as 0.1 ppm), the 1.0-ppm standard as Conc. 2, and the 10-ppm standard as Conc. 3, as each standard is analyzed. Also, Alarm 1 and 2 values should be set to 50 ppm. After the correct concentration is entered for the current analysis, press ENTER. At this time, the GC calculates and stores the correct response factor and retention time for that peak. Repeat this process for each peak or analyte in the current standard, then move on to the analysis and library storing of the next higher standard. Figure 9 shows the library information for benzene after all calibrations are complete while Figure 10 shows the 3-point calibration which has been created.

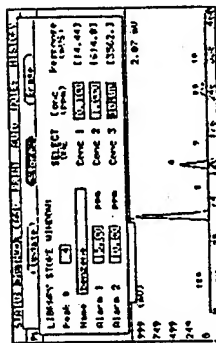


Figure 9 Library Store Window.

After all compound peak numbers and standard concentrations have been entered in the library, select METHOD and REINTEGRATE to reanalyze the last chromatogram and set all compounds to the specified concentrations. Finally, to obtain a hard copy, print out the standard chromatogram by selecting the PRINT/ANALYSIS command.

GC CALIBRATION CHECK

1. The calibration must be checked after analysis of every five samples. Only one of the three standards is used to check the calibration, namely that standard whose nominal concentration is closest to but greater than the concentrations of recent sample results (see ranges shown on calibration curve of Figure 10). For example, if most sample results are running around 300 to 700 ppb, then the 1-ppm standard (medium range) would be used for the calibration check.
2. A calibration check includes performing a repeated analysis of the chosen working standard headspace and reviewing the results printed out. If the compounds are not correctly identified and/or if the concentrations are not close to the nominal standard concentration (80-120% of

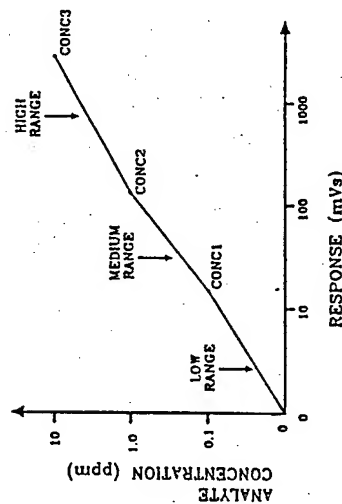


Figure 10 3-Point Calibration.

specified value), then a recalibration is necessary. This is done by storing again the peak numbers and concentrations of the chosen standard in the LIBRARY STORE WINDOW under the METHOD/LIBRARY/STORE command. Finally, REINTEGRATE and use PRINT/ANALYSIS to provide a hard copy record of the updated calibration.

SOIL AND WATER SAMPLE PREPARATION AND ANALYSIS

Consistency is very important in the preparation of soil samples. Collection and preparation of all soil samples should follow exact and consistent procedures in order to obtain meaningful results.

1. The soil samples are collected in glass jars and placed in a cooler of ice which should be maintained at 4°C ($\pm 2^{\circ}\text{C}$). Dispense 10 mL of DI water to each 40-mL VOA vial by use of a 10-mL pipet and an aspirator bulb. Approximately 10 grams of soil is collected from the glass jar and added to the 10 mL of DI water already in the 40-mL VOA vial. The weight of the soil added is determined by difference using the small electronic balance (water plus soil wt. - water wt. = soil wt.). The sample is capped with a teflon cap and is shaken for 30 seconds to mix and volatilize the BTEX or similar compounds. All samples must be warmed in the water bath for 15 minutes before injection of headspace onto the GC.
2. Water samples are prepared by simply dispensing 10 mL of aqueous sample, using a 10-mL pipet and an aspirator bulb, into a 40-mL VOA vial, and shaking for 30 seconds to volatilize the components present. All samples must be warmed in the water bath for 15 minutes before injection of headspace onto the GC.

3. Analyze headspace from prepared soil or water samples according to the procedures given in the GC ANALYSIS section. Be careful not to inject any liquid water into the GC, as it will SEVERELY DAMAGE the column and render the instrument unusable. Remember to update the NOTEPAD with sample ID information. This can be done while the GC is performing an analysis.

4. Once the peak and concentration information is obtained from the analysis printout, the concentration of the compounds in the soil can be calculated using the formula below:

$$X = \frac{(PR)(WV)}{(SS)} \quad (\text{assume for water: } 1 \text{ gram} = 1 \text{ mL})$$

Where:

X = Contaminant concentration in soil sample (in ppm);
 PR = Plotter reading (in ppm);
 WV = Weight of deionized water solution (in grams); and
 SS = Exact weight of soil sample (in grams).

Note: WV = 10 mL or 10 grams.
 SS should be as close to 10 grams as possible.
 1 ppm = 1 µg/mL.

If the soil sample is exactly 10 grams, then X = PR and no calculation is required.

SHUTDOWN

1. Shut down the IOS + GC by first selecting GC DETECTOR OFF under the STATUS command. This will turn off the PID lamp and the GC oven. Then select REMOVE FUNCTION under the STATUS command in order to clear out the GC for the next analysis session. The computer will prompt "Data will be lost," to which you can answer "Yes."
2. Press OFF. Replace the injection port septum every day or every other day (see page 8-7). Be sure the Teflon face of the septum is down and that the septum retainer is not over tightened upon replacement.

TROUBLESHOOTING

1. The instrument has been known to completely freeze up electronically, that is, no response occurs upon pressing any of the keys. To remedy this situation, open the computer module to reveal the column and electronics inside. In the upper left corner of the inside chamber, there is a red and black RESET switch. Press this switch to completely reset the instrument electronics. Close the computer module cover, and restart by pressing the main ON button. All setup and library information will have to be reprogrammed.
2. In the instance that a working standard is injected and the chromatogram comes out completely flat, check that carrier gas flow is on and set correctly, and that the DRV3 and DRV4 off times have not been accidentally reset to 0.

Johnnie Lee Hester
 ALL-WEATHER WRITING PAPER

Outdoor writing products...
 ...for outdoor writing people.

3. The septum in the INJECTION PORT 1 needs replacement if it loses resistance when the syringe is pushed through it. See page 8-7 for instructions on replacement.

4. Figure 11 presents some example problem chromatograms.

A. The later standard peaks (ethylbenzene, m,p-xylene, and o-xylene) do not come out. The ANALYSIS TIME or DRV3 or DRV4 time off operating parameters need to be adjusted as described in step 4 of GC CALIBRATION.

B. The methanol peak is obscuring the benzene and toluene peaks. Too much methanol is being carried over from decontamination activities. Allow methanol to dry off of the injection syringe before use.

C. Multiple peaks go significantly off the chromatogram right edge. Reduce the gain value to bring all of each peak within the chromatogram width.

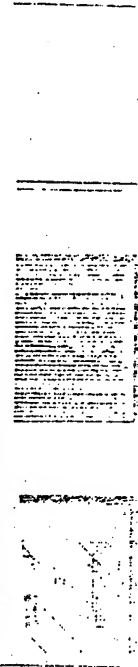
D. Benzene or other component saturates the entire chromatogram for an extended period of time. Dilute and reanalyze sample until separate (though perhaps overlapping) peaks appear on the chromatogram.

Chapter 9 provides a helpful table of other problem conditions and instructions for remedying the situation.

For other difficult problems, call Matt Alexander at the OpTech corporate office (1-800-677-8072) or a HAZCO representative (preferably Scott Robinson or Jeff Rogers) at 1-800-332-0435. When calling either OpTech or HAZCO, have available a clear description of the problem and example chromatograms. Also be prepared to receive instructions for conducting troubleshooting on-site.

REFERENCE

IOS plus Digital Gas Chromatograph User's Manual. Photovac, Inc., 25-B Jeffry Blvd. West, Deer Park, NY, (516) 254-4199.



Hold data... if it's worth collecting, it's worth preserving.

17 May 95

(71)

1748 100 PPB BTX STD

- Benzene 2 ppb
- Toluene 91 ppb
- E-Benzene 96 ppb
- mP-Xylene 138 ppb
- o-Xylene 31 ppb

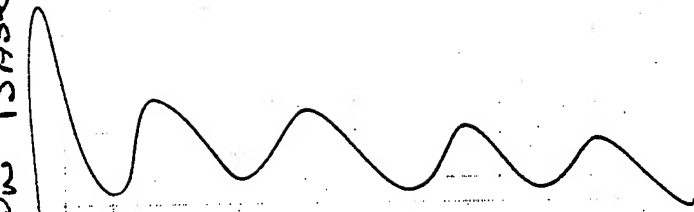
Shut down GC

1805 KP-KM-DG show up. Unload

Truck

1821 Leave base

1841 On Base



$$\begin{array}{r} 5.7 \\ 0.5 \\ \hline 6.2 \end{array}$$

$$\begin{array}{r} 10.5 \\ 6.2 \\ \hline 4.3 \end{array}$$

$$\begin{array}{r} 18.7 \\ 3.0 \\ \hline 15.7 \\ 4.3 \\ \hline 10.0 \end{array}$$

213-4.3

197 - 1.05

$$\begin{array}{r} 197 \\ 1.5 \\ \hline 213 \\ 10.0 \end{array}$$

11.5 hrs

DAY 17

(72)

THURSDAY 18 MAY 95

0650 leave hotel
Breakfast (0.6)
0650 ON BASE
Prepare truck for water
sampling PIDs for to
CALIBRATE. Iso-butylene
100 ppm
0747 CALL security for escort
to Site Z6.
Set up Decon Area
Decon equipment
0820 WRONG keys. DRILLAR have
only set.
0830 Goto 8247. Advise KP.
Return to Site Z6.
Set up on 026-001MW.
0840 Begin Purging
0932 END Purging
Prepare for Sampling.
Waiting for well to Recover
0953 Take Field Blank, SI-001FB
Waiting for well to
Recover

J. Byrnes

5.8
+.6
6.4

18 MAY 95

(73)

~~1010 TAKE JB~~
1012 Sample 026-001 MW
done
Decom Equipment
Move to 026-002 MW
1044 Begin ~~026~~ Purging.
1125 Done
1125 Begin Sampling.
1144 ~~026~~ END Sampling
Rig Down. Decon.
1204 AT 026-003 MW
Set-up.
1212 TAKE 026-003RB
1220 Begin Purging
1309 Done Purging
Waiting for Recharge
1315 Drillers move in to set
Guard Posts.
1333 Start Sampling 026-003MW
1345 Sample 026-00309 MW
Rig down.
1410 Escorted off 26
1418 At 0247.
Set up Decon & clean stuff

JB

18 MAY 95

(74)

1515 Set up on 025-002 MW

1628 Done purging
Prepare sample bottles
Wait on Recharge

1700 Sample

1710 Done

Prepare Ice chest for
FEDEX

1725 Go to FEDEX

1750 Leave FEDEX

1800 On Base

clean up stuff

1823 Leave base

1841 At Hotel

18.7
6.4
12.3

12.3 hrs

Done

DAY 18

(75)

FRIDAY

19 MAY 95

0545 leave hotel
Breakfast (0.6)

0645 On Base
load truck

0710 Fire-up GC. Build 10 PPM,
1 PPM, & 100 PPM BTEX
STD's

0740 AIR Flow is not working right.
CALL EIS to see if they
can troubleshoot.

0757 Drive KP to Site 17.

0825 BACK @ B252.

TALK to M. Alexander.

Fieldle w/ GC.

It won't go. CALL EIS.

Row is out. WAITING ON

his call back

0912 goto Site 17 to

appraise KP of situation

0945 BACK @ B252

CALL EIS.

Attempt to backflush.

J. Byrd

19 MAY 95

(76)

1000 AFTER DISCUSSIONS w/ M. Alex-
ander AND EIS, WILL SET
BOTH AIRFLOWS AND RUN
STANDARD. A VERY CLOSE
MONITORING OF RETENTION
TIMES WILL BE DONE.

1056 100 PPB BTX STD

--- NO GOOD

1109 1PPM BTX STD.

--- THIS IS NOT WORKING.

CALL EIS. ORDER NEW GC.

PACK-UP GC.

1202 GO TO FEDEX

1215 DONE AT FEDEX. GO TO SITE 17.

1220 NO ONE HERE. RETURN TO

0247.

PREPARE TRUCK FOR SAMPLING

1309 ON 025-001MW FOR SAMPLING

1420 DONE PURGING

1425 TAKE SI-802 FB (STABLE WTR)

WAITING FOR 025-001MW TO

RECHARGE.

1503 SAMPLE 025-001MW

1518 DONE SAMPLING

F. Byrd

19 MAY 95

77

1520 Go to B247 to Decon
1530 Take sample 025-003RB
1545 Go to 025-003MW
1554 Begin purging
1637 Done purging
Waiting for recharge.
1651 Call AIR Products.
Schedule bottle pickup for
next week
1655 Call Burlington Express
Schedule pickup for
Monday w/ Wed. delivery
1706 Sample 025-003MW
1715 Sample 025-003AMW
1720 Done. Break down and
decon
Move GC stuff from
B252 to B247
1835 Leave Base
1858 AL Hotel

8
18.0
6.3
12.7

12.7 hrs

gibby

DAY 19

(78)

SATURDAY 20 MAY 95

0548 Leave hotel

break-fast (0.6)

0645 DW Base

Set up new GC AREA.

Separate & pack stuff

Pack ICE chests (empty bottles)

for return to SPL.

Pack LELw/O₂ meter for

Return to HAZCO

0745 Build 10 PPM, 1 PPM &

100 PPB BTX STDs

0805 Continue Packing & Sorting

0840 Goto FEDEX to ship HAZCO

and SPL. Pick up GC.

0905 Leave FEDEX

0910 DW Base

Set up new GC, #139

• GAIN 1,000

• CARRIER GAS Flow 12 L/min

• Injection Vol 100 µl

• Oven Temp 40°C

• Analysis time 450 sec

0920 Printer is not printing

J. B. Boyle

$$\begin{array}{r} 5.8 \\ .6 \\ \hline 6.4 \end{array}$$

20 MAY 95

79

0955 CALL M. ALEXANDER TO FIND OUT
IF A HAND COPY IS NEEDED.
HE OK'S RUNNING ANALYSIS
WITHOUT PRINT OUT OF
RESULTS.

1019 100 PPB BTEX STD
MISSED SHOT

1030 100 PPB BTEX STD
Good Run. Set Library.

1046 1 PPM BTEX STD.
RT's OFF. START

ALL OVER

1109 100 PPB BTEX STD

Good Run. Set Library

1122 1 PPM BTEX STD.

Good Run. Set Library

1135 10 PPM BTEX STD

Good Run. Set Library.

1145 AIR BLANK

- BENZENE 13 ppb
- Toluene 5 ppb
- E-BENZENE 28 ppb
- MP-XYLENE 40 ppb
- O-XYLENE 95 ppb

[Signature]

②

1157 026-001 MW 10ml water

● Benzene

● Toluene 296

● E-Benzene

1207 026-002 MW 10ml water

● Benzene

1218 026-003mw	10ml water
----------------	------------

● ALL NDS

1227 025-001 MW 10ml water

● ALL NDS

1236 025-002MW 10ml water

● Benzene

1245	100	PPB	Brex	STB
------	-----	-----	------	-----

CALIBRANT	PPb	RT
Benzene	109	62.3
Toluene	97	126.5
E-Benzene	92	262.6
m-xylene	178	281.6
O-xylene	77	328.8

--- Recall to 100, 100, 100, 200, 100

1255 AIR BLANK

● ALL ND's

1304 0.25-0.03 MW 10 ml water

● Benzene 1,920 ppb

729272

20 MAY 95

81

● Toluene 963 ppb
● E-Benzene 318 ppb
● MP-Xylene 1,400 ppb
● O-Xylene 1,090 ppb

1315 1 PPM BTX STD

— Benzene 1,020 ppb
— Toluene 1,040 ppb
— E-Benzene 1,110 ppb
— MP-Xylene 2,300 ppb
— O-Xylene 1,130 ppb

1328 Shut down GC.

Start Packing

1723 leave base

1749 At hotel

178
6.4
—
11.4

11.4 hrs

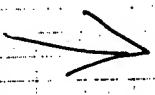
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21 MAY 95

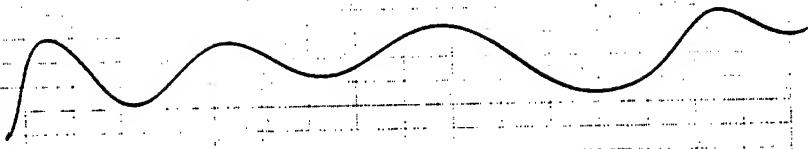
82

TRAVEL DAY

0830 leave hotel. Refuel car.



1800 Home



9.5 hr

Handwritten signature or name, possibly 'M. J. Smith', written diagonally across the page.

APPENDIX G

SURVEY REPORTS

INTRODUCTION

This appendix contains the survey report for the SI on soil borings and monitor wells at IRP Sites No. 25 and No. 26, and includes information such as elevation, depth and Minnesota State plane coordinates. The elevations for monitor wells were taken at the top of the well casings on the north side of the well. This appendix also includes surveyors' reports for wells and boreholes at IRP Sites No. 25 and No. 26.

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Table G.1
Summary of Elevations and Coordinates for
Monitor Wells and Boreholes at IRP Sites No. 25 and No. 26
148th FW, Duluth ANGB, Duluth, Minnesota

Location IRP Site No. 25	North	East	Surface Elevation	Top of Casing Monitor Wells only
Soil Borings				
025-01BH	406,337.47	432,901.10	1,421.34	NA
025-02BH	406,391.88	432,901.10	1,421.24	NA
025-03BH	406,264.35	432,897.70	1,420.98	NA
025-04BH	406,273.70	432,754.82	1,423.53	NA
025-05BH	406,228.64	432,745.46	1,423.87	NA
025-06BH	406,143.67	432,877.29	1,421.05	NA
025-07BH	406,271.15	432,698.68	1,425.96	NA
025-08BH	406,108.76	432,921.52	1,421.97	NA
025-09BH	406,092.61	432,909.61	1,417.29	NA
025-010BH	406,003.34	432,939.38	1,398.19	NA
025-011BH	406,107.06	432,988.71	1,397.29	NA
025-012BH	406,386.78	432,897.70	1,421.29	NA
025-013BH	406,301.76	432,850.92	1,421.97	NA
Monitor Wells				
025-001MW	406,482.33	432,810.44	1,422.59	1,422.56
025-002MW	406,024.17	432,953.32	1,397.83	1,400.21
025-003MW	406,246.50	432,982.35	1,402.71	1,405.32
Location IRP Site No. 26	North	East	Elevation	Top of Casing Monitor Wells only
Soil Borings				
026-001BH	3,775.61	10,876.74	1,422.28	NA
026-002BH	3,692.45	10,873.01	1,421.61	NA
026-003BH	3,621.55	10,873.01	1,422.21	NA
026-004BH	3,775.61	10,978.40	1,423.90	NA
026-005BH	3,687.66	10,972.20	1,424.77	NA
026-006BH	3,614.09	10,968.46	1,425.43	NA
Monitor Wells				
026-001MW	3,568.25	10,933.27	1,424.69	1,424.62
026-002MW	3,801.20	10,863.84	1,421.90	1,424.28
026-003MW	3,670.70	10,767.12	1,420.44	1,422.90

BH - Borehole.
NA - Not Applicable.

MW - Monitor Well.

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APPENDIX H

INVESTIGATION DERIVED WASTE MANAGEMENT

INTRODUCTION

This appendix concerns the contents of the five drums of investigation derived waste which was generated during the SI at the 148th Fighter Wing, Minnesota ANGB, Duluth, Minnesota. Four of these drums contain soil cuttings and one contains monitor well development and purge water. Attached Table H.1 is a summary of the recommended disposition for each of these drums. Attached Table H.2 is a summary of the maximum concentrations of analytes contained in each drum containing soil from drill cuttings. Attached Table H.3 is a summary of the maximum concentrations of analytes contained in the drum containing well development and purge water.

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Table H.1
Recommended Disposition of Investigation Derived Waste
148th FW, Duluth ANGB, Duluth, Minnesota

Drum Identification	Origin	Recommended Disposition	Rationale
025-001BH 025-003BH	Drill cuttings Soil	Soil cuttings should be treated as petroleum-contaminated soil before returning to the site.	Based on analytical results, BTEX concentrations are greater than 5 ppm.
025-002BH 025-013BH	Drill cuttings Soil	Soil cuttings should be treated as petroleum-contaminated soil before returning to the site.	Based on analytical results, BTEX concentrations are greater than 5 ppm.
025-006BH	Drill cuttings Soil	The soil cuttings can be returned to the site.	Based on analytical results, BTEX concentration is 0.005 ppm.
025-003MW	Drill cuttings Soil	Soil cuttings should be treated as petroleum-contaminated soil before returning to the site.	Based on GC screening results, BTEX concentrations are greater than 5 ppm.
025-003MW	Development and Purge Water	Determine whether City of Duluth Waste-Water Management will allow BTEX-contaminated water to be disposed of in the City sewer system.	Based on analytical results, BTEX concentrations exceeded the Federal and State ARARs.

BH - Borehole.
MW - Monitor Well.
ppm - parts per million.
GC - Gas Chromatograph.

BTEX - Benzene, Toluene, Ethylbenzene, and Xylenes.
ARARs - Applicable or Relevant and Appropriate Requirements.

Table H.2
Site Investigation Derived Waste – Drums Containing Soil Cuttings
148th FW, Duluth ANGB, Duluth, Minnesota

Analyte	Maximum Concentrations ($\mu\text{g}/\text{kg}$)	Action Level Concentrations ($\mu\text{g}/\text{kg}^*$)	Standards Used
BTEX			
Benzene	84,000	NA	—
Ethylbenzene	140,000	NA	—
Toluene	460,000	NA	—
Xylenes	680,000	NA	—
SVOCs			
2-methylnaphtalene	12,000	NA	—
Naphthalene	14,000	NA	—
Pyrene	360	NA	—
Flouranthene	420	NA	—
Metals			
Nickel	25	NA	—

* — There are no State cleanup levels for the above analytes
 $\mu\text{g}/\text{L}$ — micrograms per liter.

Table H.3
Site Investigation Derived Waste – Drum Containing Development and Purge Water
148th FW, Duluth ANGB, Duluth, Minnesota

Analyte	Maximum Concentrations in Development an Purge Water ($\mu\text{g}/\text{L}$)	Action Level Concentration ($\mu\text{g}/\text{L}$)	Standard Used
BTEX			
Benzene	2,600	10	HRL
Ethylbenzene	1,300	700	HRL
Xylenes (total)	1,450	10,000	HRL
SVOCs			
4-Methylphenol	8	3	HRL

$\mu\text{g}/\text{L}$ — micrograms per liter.

APPENDIX I

GEOTECHNICAL REPORT

INTRODUCTION

This appendix presents geotechnical data for soil samples from the Site Investigation at IRP Site No. 26. On the following pages are grain-size distribution reports for soil samples collected from monitor wells 026-002MW and 026-003MW. Also presented in this appendix are permeability test lab data (vertical hydraulic conductivity) and information on pH cation exchange capacity for soil samples collected from monitor wells. The chain-of-custody forms for these soil samples are also included in this appendix. Grain size ranged from clay-sized particles to fine gravel, with silt and fine sand making up the majority of the soil constituents.

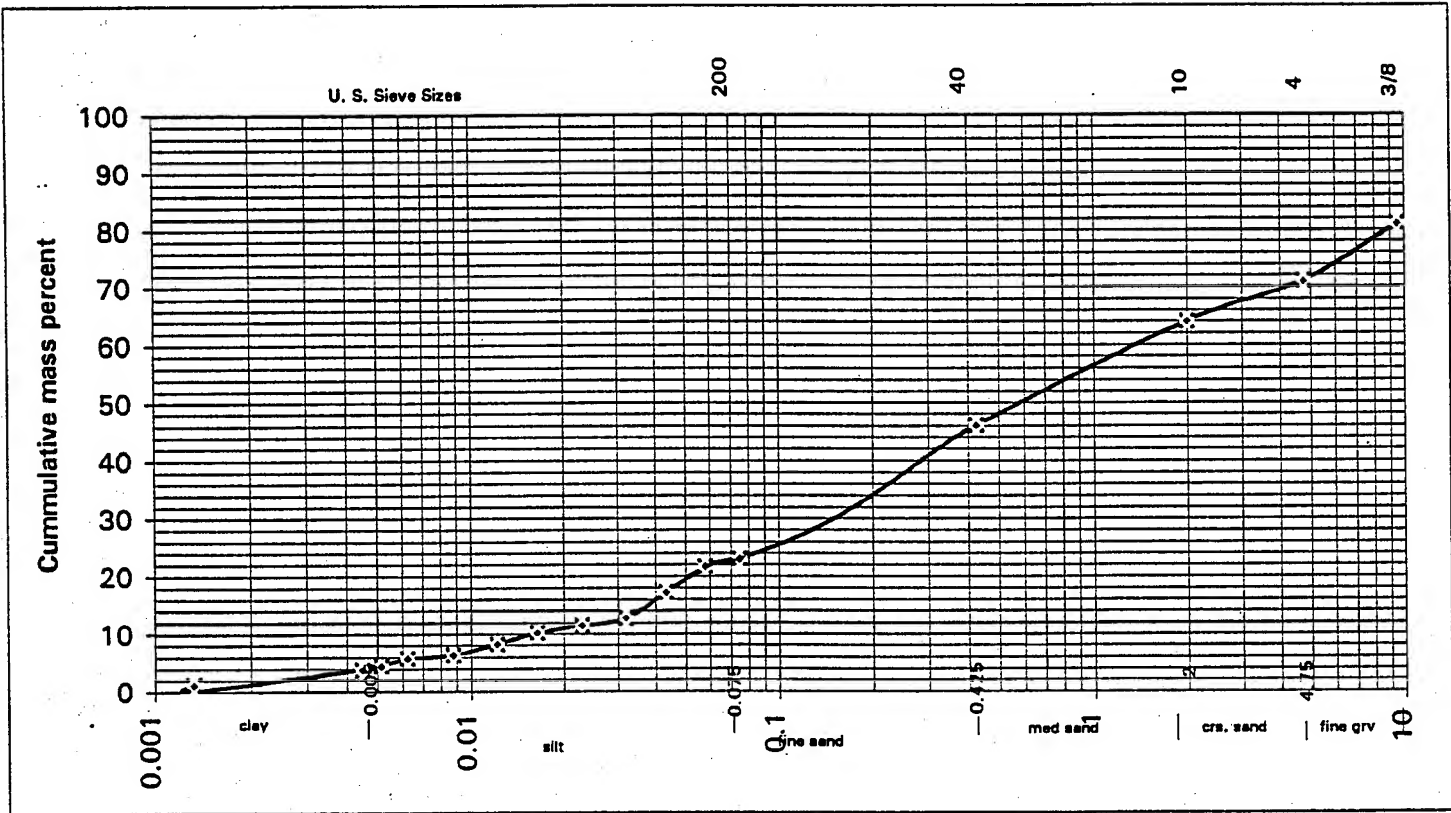
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NORTHEAST TECHNICAL SERVICES, INC.
P.O. Box 1142
315 Chestnut Street
Virginia, Minnesota 55792
(218) 741-4290 Fax (218) 741-4291

GRAIN SIZE DISTRIBUTION REPORT

Project: OTC - Duluth Air Base
Sample #: #1 226-002MW 0.5' - 2.5'

Job # 3482.09
Date: 24-May-95



Size	Percentages	Classification	Percent Moisture		Organic Content	
Clay	4	SM silty sand with gravel	17.8		0%	
Silt	18					
Fine Sand	24					
Medium Sand	18					
Coarse Sand	7					
Fine Gravel	29					

NORTHEAST TECHNICAL SERVICES, INC.
P.O. Box 1142
315 Chestnut Street
Virginia, Minnesota 55792
(218) 741-4290 Fax (218) 741-4291

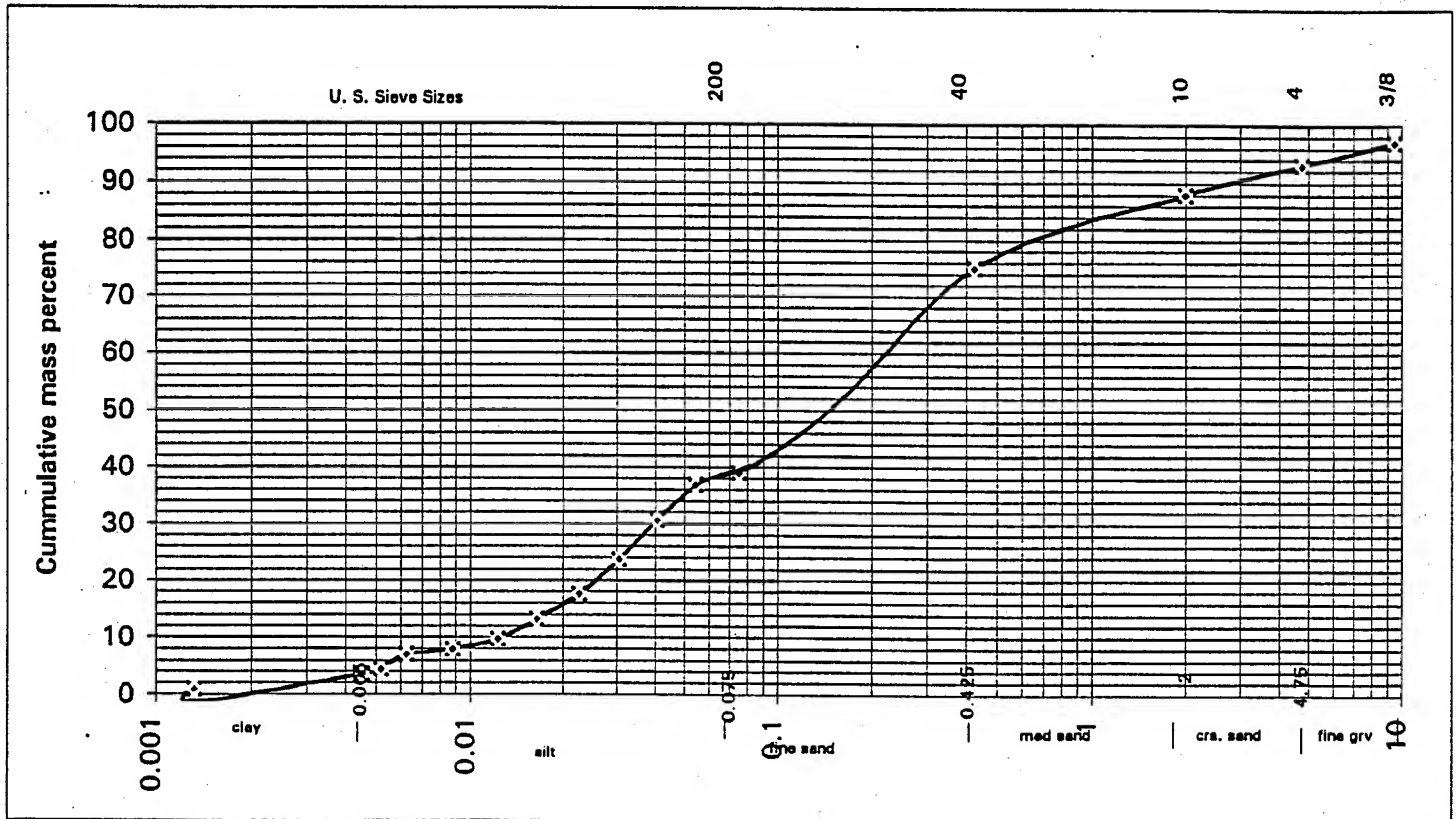
GRAIN SIZE DISTRIBUTION REPORT

Project: OTC - Duluth Air Base

Job # 3482.09

Sample #: #2 026-003MW 15-17

Date: 24-May-95



Size	Percentages	Classification	Percent Moisture		Organic Content	
Clay	5	SM silty sand	14.8		13.80%	
Silt	34					
Fine Sand	36					
Medium Sand	13					
Coarse Sand	5					
Fine Gravel	7					

PERMEABILITY TEST LAB DATA

DATE: 5/17/95

PROJECT #:

3482.09

REPORT Operational Technologies Corp.
4100 NW Loop, Suite 230
San Antonio, TX 78229-4253

Permeability Tests on Brass Sleeve
Samples from the Duluth Air Base
IRP Site 26
Duluth, MN

Sample Number:	#1 026-002MW	#2 026-003MW
Sample Location:	0.5 - 2.5	15 - 17
Soil Classification:	SM silty sand w/gravl	SM silty sand
Elevation:		
Type of Sample:	Brass liner sample	Brass liner sample
Specimen Height (cm):	14.5	13.35
Specimen Diameter (cm):	3.5	3.5
Water Content %:	8.4	14.8
Dry Unit Weight (lbs/cf)	106.2	123.3
Max. Head Differential (ft):	4.00	4.00
Confining Pressure (psi):	2.00	2.00
Coefficient of Permeability K @ 20 C (cm/sec)	1.10×10^{-3}	3.55×10^{-6}
Permeant Liquid Used	distilled water	distilled water

Northeast Technical Services, Inc.

315 CHESTNUT STREET • P.O. BOX 1142 • VIRGINIA, MINNESOTA 55792 • (218) 741-4290 • FAX (218) 741-4291

Lab Number: 95-3701

TO: Duluth Ang/Duth SI

MN Environmental Lab No:
#027-137-157

Date Collected: 05/06/95

Date Received: 05/08/95

Date Reported: 05/23/95

Sample Description: 026-002-MW-0.5-2.5


Parameter

Result

pH

6.56 SU

Cation Exchange Capacity 127 meg/100 grams

Report approved by: 
JOHN H. SEURER
ANALYTICAL SERVICES

Analyses were performed by methods approved by the U.S. Environmental Protection Agency and the Minnesota Department of Health.

Northeast Technical Services, Inc. makes no warranty except that the analysis has been made upon the samples received in accordance with generally accepted testing laboratory principles and practices. The results of the analysis may not be characteristic of the whole from which the sample was taken. This warranty is in lieu of all other warranties, either expressed or implied.

Northeast Technical Services, Inc.

315 CHESTNUT STREET • P.O. BOX 1142 • VIRGINIA, MINNESOTA 55792 • (218) 741-4290 • FAX (218) 741-4291

Lab Number: 95-3700

TO: Duluth Ang/Duth SI

MN Environmental Lab No:
#027-137-157

Date Collected: 05/06/95
Date Received: 05/08/95
Date Reported: 05/23/95

Sample Description: 026-003MW-15-17

Parameter

Result

pH

7.54 SU

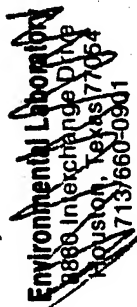
Cation Exchange Capacity 45.6 meq/100 grams

Report approved by:
JOHN H. SEURER
ANALYTICAL SERVICES

RMS

Analyses were performed by methods approved by the U.S. Environmental Protection Agency and the Minnesota Department of Health.

Northeast Technical Services, Inc. makes no warranty except that the analysis has been made upon the samples received in accordance with generally accepted testing laboratory principles and practices. The results of the analysis may not be characteristic of the whole from which the sample was taken. This warranty is in lieu of all other warranties, either expressed or implied.



Analysis Request and Chain of Custody Record

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APPENDIX J

HAZARDOUS RANKING SYSTEM DATA PACKAGE

INTRODUCTION

This appendix presents information needed by personnel performing a Hazardous Ranking System (HRS) study.

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SITE INVESTIGATION (SI) DATA REQUIREMENTS FOR FEDERAL FACILITY DOCKET SITES

DULUTH AIR NATIONAL GUARD STATION DULUTH, MINNESOTA

1. **Supply copies of all previous sampling data, on-site and off-site, including location map, detection limits, raw data sheets, QA/QC documents, date(s) sampled, analytical method(s) used, well or boring logs, and sampling technique(s).**

On-site and off-site sampling data, detection limits, and sampling techniques are found in Section 5 of this SI Report. Location maps are found in several sections of the SI Report including Section 1, Figure 1.1, Section 2, Figures 2.1 and 2.2. Raw data sheets, dates of sampling, and analytical methods are found in Appendix M of the SI. Well and boring logs can be found in Appendices C and A respectively. QA/QC documents are found in Appendix L.

2. **Locate and identify on a map all known or suspected sources. Supply all information about source(s) such as: dates of operation, use, or spillage, amounts of material deposited, stored, or spilled, dimensions of source(s), known or suspected hazardous substances, etc.**

A map of IRP Site No. 25 is shown on Figure 2.1 of this SI. The source of contamination for the site is the old motor pool building which has been used for vehicle refueling, repair, storage, and maintenance. The source of suspected contamination is the outfall of the floor drains from the motor pool location. The old motor pool was in use from the late 1940s until the new motor pool was built in 1986. Known hazardous substances in use include unleaded and leaded gasoline, diesel fuel, waste solvents, and detergents.

As shown in Figure 2.2 of this SI, IRP Site No. 26, Ramp Disposal Area, is located to the west of Building (Bldg.) 500, which was built in 1952. The building has been in continuous use as an aircraft hangar and maintenance facility since that time. The aircraft parking ramp in front of Bldg. 500 has also been in continuous use since the earliest days of Duluth ANGB. Unknown quantities of contaminated aviation fuels and waste solvents were stored or disposed of on the soil adjacent to the ramp, according to information gathered from interviewees and aerial photography.

3. **Provide a description of all aquifers beneath the site, including a description of overlying materials, depth first encountered, thickness, and composition.**

A description of groundwater and soil conditions is included in Section III of the Preliminary Assessment (PA) conducted for Duluth ANGB by OpTech in 1993. A Generalized Stratigraphic Column and a Diagrammatic Geologic Cross-Section of the Duluth Complex are shown in Figures III-1 and III-2 of the 1993 PA, respectively. The U. S. Geological Survey (USGS) publishes Water Resources of the Lake Superior Watershed, Northeastern Minnesota, Hydrologic Investigations Atlas HA-582 and Water Resources of the St. Louis River Watershed, Northeastern Minnesota, Hydrogeologic Investigations Atlas HA-586, both of which may be obtained from USGS.

4. **For each source, choose one description from Table 1 that describes the groundwater contaminant. Provide complete documentation (i.e., engineering diagrams, original photos, etc.) as to why the source meets that description.**

IRP Site No. 25 source: Evidence of hazardous substance migration from source area (i.e., source area includes source and any associated containment structures); no liner.

Rationale: As noted in the RCRA Facility Investigation by OpTech in August 1992 free product was detected downgradient from the old motor pool area. Interviewee information provided information that the 10,000-gallon (gal.) motor vehicle gasoline (MOGAS) underground storage tank (UST) in the old motor pool had been abandoned and filled with water in 1990. However, in the Spring of 1992, the tank was discovered with only 9 inches of water in it, leading the interviewee to conclude that the tank had a leak in it. BTEX and SVOCs in the naphthalene group, were detected in high concentrations in the soil samples taken near the former diesel and MOGAS USTs and waste solvent UST, respectively. BTEX, SVOCs, and 1,2 dichloroethane were detected in groundwater samples taken downgradient from the former diesel and MOGAS USTs.

IRP Site No. 26 source: Evidence of hazardous substance migration from source area (i.e., source area includes source and any associated containment structures); no liner.

Rationale: The non-paved area adjacent to the aircraft ramp west of Bldg. 500 and extending up to the area west of Bldg. 499 was used to store unknown numbers of 55-gal. drums containing contaminated jet fuel. In addition, buckets of contaminated fuel were poured on the ground along the edge of the ramp. Discoloration of soil was visible

on aerial photos and soil staining was reported by former aircraft maintenance personnel. VOCs were detected in a duplicate, but not in the original soil sample. Polyaromatic hydrocarbons (PAHs) were detected in a near-surface soil sample taken near the aircraft ramp.

5. **Provide the location of all drinking water wells in all aquifers beneath the site in a 4-mile radius from the site (property boundary) by HRS distance ring and locate the wells within a one mile radius on a 7.5-minute topographic map. Provide information on depth of wells, screening intervals, depth of aquifers encountered, population served for multiple wells (i.e., municipal system), the number of wells, location of all wells (regardless of 4-mile limit), average annual pumpage from each well (regardless of 4-mile limit), and total population served by the system. Include information on all standby wells.**

A map with all drinking water wells within a 1-mile radius of Duluth ANGB is shown in Figure 3.1 of this SI. Additional private wells are located between two and four miles of the Duluth International Airport. All water well logs for these 63 privately-owned wells within this area are shown in Section Q of the appendices of the 1993 PA. The City of Duluth and nearby townships draw their drinking water from Lake Superior. Population figures are included in the response to Question 13. According to local agencies, no standby wells exist.

6. **Provide information and location (on a 7.5-minute topographic map) of wells within 4 miles that are used to irrigate 5 or more acres of commercial food or forage crops, or watering of commercial livestock, or ingredient in commercial food preparation, or supply for aquaculture, or supply for a major or designated water recreation area, excluding drinking water use.**

Two factors rule out well water being used extensively to support the commercial food chain in the Duluth area: (1) water for the irrigation of local crops and the watering of livestock is drawn from abundant surface water sources, and (2) commercial agriculture in the Duluth area is negligible. Literally hundreds of small creeks and ponds surround the Duluth ANGB; the water table is very high. An annotated topographic map, showing wetlands is shown in Section Q of the appendices of the 1993 PA, as well as an annotated topographic map showing local agricultural activity.

7. **What is the average number of persons per residence for the county (or counties) that the site is located in per the U. S. Census Bureau?**

According to 1990 Census data, the population of St. Louis County is 2.43 persons per residence.

8. **Identify and locate all surface water bodies within 2 miles of the site, marking off on the drainage routes (shown on a 7.5-minute topographic map) from each source to applicable surface water bodies. Provide the average annual cubic feet per second flow for each surface water body within 15 miles downriver, or 15-mile radius from the point of probable entry into surface water. For lakes, provide information on inflow and outflow.**

Miller Creek, which flows past the eastern perimeter of Duluth ANGB, is a minimally flowing water body, especially during the winter months, according the City of Duluth Area Hydrologist. The creek flow is not officially measured by local officials. Beaver Creek flows north from a north-south drainage ditch and eventually empties into Wild Rice Lake, north of Duluth International Airport. The annual cubic flow is not measured. Both creeks and the reservoir are shown on Figures III-3 and III-4 of the 1993 PA.

9. **What is the number of acres in each drainage basin?**

Miller Creek drains approximately 1,200 acres before it empties into Lake Superior. The creek traverses a broader plain as it passes Duluth ANGB and then becomes more channelized as it flows southeastward and eventually empties into Lake Superior. Beaver Creek drains both the 2,000-acre Duluth International Airport and an area of approximately 1,300 acres as it flows northward into Wild Rice Lake.

10. **Choose the predominant soil group (surface soil) which comprises the largest total area within each drainage area.**

The area within a 2-mile radius of Duluth ANGB is classified as Highland Moraine. Five major soil groups are found in this area. Soil Interpretations Records for the five major soil groups (Ahmeek, Hermantown, Twig, Cathro, and Rifle) are found in the Q Section of the appendices of the 1993 PA.

11. What is the 2-year, 24-hour rainfall?

The 2-year, 24-hour rainfall is 2.5 inches, according to the State of Minnesota Department of Natural Resources Area Hydrologist.

12. Choose the floodplain category for each source (supply FEMA floodplain map) and determine if each source meets the selected floodplain criteria.

Because Duluth ANGB is located on an elevated hill above the level of any flood sources, the Base is not located within any historic floodplains. Additionally, the Federal Emergency Management Agency has elected not to map either Duluth International Airport or the ANGB because of the non-existent flood threat.

13. Provide the location of all drinking water intakes within 15 miles downstream (for rivers) or 15-mile radius (lakes, bays, etc.). Provide information on the population served. For multiple intakes (i.e., municipal systems) provide information on the number of intakes, the location of all intakes (regardless of the 15-mile limit), and the total population served by the system. Include information on all standby intakes.

A map of the location of the single drinking water intake on Lake Superior that serves as the City of Duluth municipal water supply is found in the Q Section of the appendices of the 1993 PA. Section Q also provides a cross-section schematic of the City of Duluth municipal water supply. According to the Chief Engineer of the City of Duluth Water and Gas Department, the system averages 13 million gallons per day during the year, with summer peaks rising to 30 million gallons per day. The municipal water system serves approximately 105,000 people in the greater Duluth area, including the Duluth ANGB.

14. Provide information and the location of all water intakes within 15 miles downriver (radius in lake or bay) that are used to irrigate 5 or more acres of commercial food or forage crops, or watering of commercial livestock, or ingredient in commercial food preparation, or supply for aquaculture, or supply for a major or designated water recreation area, excluding drinking water use.

As discussed in Question 13, only one water intake serves the greater Duluth area. Abundant surface water augments City Water supplies for the resident population.

15. Is any surface water body 15 miles downriver (radius in lakes or bay) used for drinking water?

Lake Superior is within 15 miles of Duluth ANGB. It is the major surface water body that provides drinking water to the Duluth population.

16. What is the average human food chain production (pounds per year) for each surface water body 15 miles downriver or 15-mile radius in lake?

Not applicable. Source: Minnesota Department of Natural Resources.

17. Within a 4-mile radius from the site and 15 miles downriver or radius in a lake, identify all sensitive environments that exist. Provide original documentation (USF&W, Natural Heritage Database, State agencies, NOAA, etc.) and locate each area by HRS distance ring. Note that there could be multiple sensitive environments within a sensitive environment.

Sensitive environments are discussed in Section 3.0 of this SI Report. Figure 3.4 of the SI includes the locations of all sensitive environments in the vicinity of the Base. The Base itself does not include any sensitive environments.

18. What is the linear frontage of all wetlands 15 miles downriver or within a 15-mile radius from a lake?

To determine extent of wetland frontage, a National Wetlands Inventory Map overlay, dated November 1978, showing wetlands within the Duluth Heights 7.5-minute topographic map was utilized. Literally hundreds of wetlands, seasonal and permanent, exist within a 15-mile radius of the Base, and on all sides of the Base. The linear frontage, as a result, may be expressed in hundreds of miles. A topographic map of the Duluth ANGB area with the National Wetlands Inventory Map overlay is provided in Section Q of the appendices for the 1993 PA.

19. What is the location and number of persons residing, working, attending school or day care within 200 feet of each source?

No schools or day care centers are located on Duluth ANGB. The nearest schools, Kenwood Elementary (population: 252), Home Craft Elementary (population: 445), and Central High School (population: 1,700) are located two miles or more from the Base.

IRP Site No. 25, Old Motor Pool: Bldgs. 240 and 242 are located in the old motor pool area. Four personnel work between both buildings. Across the street adjacent to the abandoned unleaded gasoline UST, 23 personnel work in Bldg. 231 and 2 people work in Bldg. 230. A map showing the 200-foot radius and population information is found Section Q of the appendices for the 1993 PA.

IRP Site No. 26, Ramp Disposal Area: A variety of aircraft maintenance facilities are located within 200 feet of Bldg. 500. A total of 32 personnel work in Bldgs. 203, 204, 199, 497, 498, and 214. A map showing the 200-foot radius and population information is found in Section Q of the appendices for the 1993 PA.

In all cases, on-Base population figures represent normal, daily use of the facilities. On guard weekends, the Base population greatly expands. Figures for Guard weekends are unavailable from Duluth ANGB sources.

20. Identify all terrestrial sensitive environments that exist on-site. Provide original documentation (USF&W, Natural Heritage Database, State agencies, NOAA, etc.) and locate each on a 7.5-minute topographic map. Note that there could be multiple sensitive environments within a sensitive environment.

No terrestrial sensitive environments exist on-site.

21. For each source, choose one description from Table 8 that describes the accessibility of the site to a human population. Provide complete documentation (i.e., engineering diagrams, photographs (originals)) as to why the source meets that description.

IRP Site No. 25, Old Motor Pool: Physically inaccessible to the public, with no evidence of public recreation use. Figure IV-1 of the 1993 PA shows the motor pool in a fenced area within the confines of the Duluth ANGB.

IRP Site No. 26, Ramp Disposal Area: Physically inaccessible to the public, with no evidence of public recreation use. Figure IV-2 of the 1993 PA shows the area adjacent to active aircraft taxiway/aircraft parking and maintenance area, which, at present, is also restricted from Base personnel.

22. What is the total number of people in the following distance rings from source(s)?

<u>Distance</u>	<u>Ring Total</u>	<u>Aggregate Total</u>
0-1/4 mile:	126	126
1/4-1/2 mile:	41	167
1/2-1 mile:	750	917
1-2 miles:	2,058	2,975
2-3 miles:	13,046	16,021
3-4 miles:	4,495	20,516

Use 1990 Census data and/or actual house counts. Document how calculated.

Raw 1990 Census data was gathered from the Arrowhead Regional Development Commission, Duluth, Minnesota. Data from Duluth and the townships of Canosia, Hermantown, and Rice Lake were included in computations. Mileage circles were used as overlays on 1990 Census tract maps, which were subdivided into Census blocks. All census blocks that fell within the mileage circles were included in their entirety. Partial blocks were interpolated for the percentage of the total census that was included. Direct computational involvement by the Arrowhead Regional Development Commission ensured accuracy in 1990 Census figures. A copy of the 1990 Census Tract Map is attached for informational purposes.

23. For each source, choose one description from Table 9 that describes the gaseous containment. Provided complete documentation (i.e., engineering diagrams, photographs (originals)) as to why the source meets that description. From Table 10, choose the appropriate description of each source type. For each source, choose one description from Table 11 that describes the particulate containment.

Provide complete documentation (i.e., engineering diagrams, photographs (originals)) as to why the source meets the description.

IRP Site No. 25, Old Motor Pool: Source covered with essentially impermeable, regularly inspected, maintained cover.

Rationale: The old motor pool facility is fully paved with an asphalt surface. Metal hatches are used to access the USTs. There are no open pathways for volatile gases to escape from the USTs. Figure IV-1 shows the configuration of the old motor pool area – the configuration is taken from current Base Civil Engineering drawings.

IRP Site No. 26, Ramp Disposal Area: Uncontaminated soil cover > 3 feet: Source substantially vegetated with little exposed soil.

- 24. What is the location and area (in acres) of all wetlands within a 4-mile radius of the site?**

See response to Question 18. According to the U. S. Fish and Wildlife Service National Wetlands Inventory Map dated November 1978, there are hundreds of acres of wetlands within a 4-mile radius of Duluth ANGB. The maximum HRS rating for this item should be used. The topographic map which includes wetlands is found in Section Q of the appendices of the 1993 PA.

- 25. Contact the United States Environmental Protection Agency (USEPA) Regional Office immediately if any radionuclides are present or suspected at a site and supply all radiological information known to date.**

No radioactivity has been recorded at IRP Sites No. 25 and No. 26.

- 26. For all of the above information, use primary data sources and supply 2 copies or specify where copies may be obtained.**

See 1993 PA Report.

27. Have any removals or remedial actions taken place at the site(s)?

IRP Site No. 25, Old Motor Pool: The USTs at the old motor pool were emptied and abandoned in 1986 when the new motor pool area was constructed. Actions were not taken as environmentally-focused remedial or removal actions, but as a normal part of the transition to the new motor pool facility.

IRP Site No. 26, Ramp Disposal Area: Remedial actions are under review at Duluth ANGB.

APPENDIX K

SUMMARY OF ANALYTICAL RESULTS FOR SOIL AND GROUNDWATER SAMPLES

INTRODUCTION

The following is a list of analytical results for soil and groundwater samples collected at IRP Sites No. 25 and No. 26.

IRP SITE NO. 25

SOIL SAMPLES

- K.1 – Volatile Soil Analytical Results for IRP Site No. 25
- K.2 – Semivolatile Soil Analytical Results for IRP Site No. 25
- K.3 – Metals Soil Analytical Results for IRP Site No. 25

GROUNDWATER SAMPLES

- K.4 – Halogenated Volatile Groundwater Analytical Results for IRP Site No. 25
- K.5 – Semivolatile Groundwater Analytical Results for IRP Site No. 25
- K.6 – Metals Groundwater Analytical Results for IRP Site No. 25

IRP SITE NO. 26

SOIL SAMPLES

- K.7 – Volatile Soil Analytical Results for IRP Site No. 26
- K.8 – Semivolatile Soil Analytical Results for IRP Site No. 26
- K.9 – Metals Soil Analytical Results for IRP Site No. 26

GROUNDWATER SAMPLES

- K.10 – Volatile Groundwater Analytical Results for IRP Site No. 26
- K.11 – Semivolatile Groundwater Analytical Results for IRP Site No. 26

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Volatiles Soil Analytical Results for Site No. 25 **Duluth Air National Guard Base, Duluth, Minnesota**

(Results in micrograms per kilogram unless otherwise noted)

Location No.:	025-001BH 6.5-7	025-002BH 11.5-12	025-003BH 11-12	025-003BH 11-12 Dup	025-004BH 11.5-12	025-004BH 19.5-20
Sample Date:	05/15/95	05/15/95	05/15/95	05/15/95	05/16/95	05/16/95
Lab Sample No.:	9505556-02	9505556-03	9505556-04	9505556-05	9505612-05	9505612-06
VOCs	Matrix	Soil	Soil	Soil	Soil	Soil
Acetone	250000 U	25000 U	500 U	25000 U	100 U	100 U
Benzene	84000	1700	25 U	1200 U	5 U	5 U
Bromodichloromethane	12000 U	1200 U	25 U	1200 U	5 U	5 U
Bromoform	12000 U	1200 U	25 U	1200 U	5 U	5 U
Bromomethane	25000 U	2500 U	50 U	2500 U	10 U	10 U
2-Butanone	50000 U	5000 U	100 U	5000 U	20 U	20 U
Carbon Disulfide	12000 U	1200 U	25 U	1200 U	5 U	5 U
Carbon Tetrachloride	12000 U	1200 U	25 U	1200 U	5 U	5 U
Chlorobenzene	12000 U	1200 U	25 U	1200 U	5 U	5 U
Chloroethane	25000 U	2500 U	50 U	2500 U	10 U	10 U
2-Chloroethylvinylether	25000 U	2500 U	50 U	2500 U	10 U	10 U
Chloroform	12000 U	1200 U	25 U	1200 U	5 U	5 U
Chloromethane	25000 U	2500 U	50 U	2500 U	10 U	10 U
Dibromochloromethane	12000 U	1200 U	25 U	1200 U	5 U	5 U
1,1-Dichloroethane	12000 U	1200 U	25 U	1200 U	5 U	5 U
1,1-Dichloroethene	12000 U	1200 U	25 U	1200 U	5 U	5 U
1,2-Dichloroethane	12000 U	1200 U	25 U	1200 U	5 U	5 U
total-1,2-Dichloroethene	12000 U	1200 U	25 U	1200 U	5 U	5 U
1,2-Dichloropropane	12000 U	1200 U	25 U	1200 U	5 U	5 U
cis-1,3-Dichloropropene	12000 U	1200 U	25 U	1200 U	5 U	5 U
trans-1,3-Dichloropropene	12000 U	1200 U	25 U	1200 U	5 U	5 U
Ethylbenzene	140000	9700	120	5300	5 U	5 U
2-Hexanone	25000 U	2500 U	50 U	2500 U	10 U	10 U
Methylene Chloride	12000 U	1200 U	25 U	1200 U	5 U	5 U
4-Methyl-2-Pentanone	25000 U	2500 U	50 U	2500 U	10 U	10 U
Styrene	12000 U	1200 U	25 U	1200 U	5 U	5 U
1,1,2,2-Tetrachloroethane	12000 U	1200 U	25 U	1200 U	5 U	5 U
Tetrachloroethene	12000 U	1200 U	25 U	1200 U	5 U	5 U
Toluene	460000	26000	25 U	1200 U	5 U	5 U
1,1,1-Trichloroethane	12000 U	1200 U	25 U	1200 U	5 U	5 U
1,1,2-Trichloroethane	12000 U	1200 U	25 U	1200 U	5 U	5 U
Trichloroethene	12000 U	1200 U	25 U	1200 U	5 U	5 U
Trichlorofluoromethane	12000 U	1200 U	25 U	1200 U	5 U	5 U
Vinyl Acetate	25000 U	2500 U	50 U	2500 U	10 U	10 U
Vinyl Chloride	25000 U	2500 U	50 U	2500 U	10 U	10 U
Xylenes (total)	680000	52000	800	29000	5 U	5 U

BH - Borehole
VOC - Volatile Organic Compounds

U - Indicates compound was analyzed for but not detected

Appendix K.1

Volatile Soil Analytical Results for Site No. 25 Duluth Air National Guard Base, Duluth, Minnesota

(Results in micrograms per kilogram unless otherwise noted)

Location No.:	025-005BH 11.5-12	025-006BH 21.5-22	025-007BH 11.5-12	025-008BH 10.5-11.0	025-008BH 14.5-15.0	025-009BH 11-12
Sample Date:	05/16/95	05/12/95	05/16/95	05/12/95	05/12/95	05/12/95
Lab Sample No.:	9505612-04	9505512-08	9505612-03	9505512-02	9505512-03	9505512-10
VOCs	Matrix	Soil	Soil	Soil	Soil	Soil
Acetone	100 U	100 U	100 U	100 U	100 U	100 U
Benzene	5 U	5 U	5 U	5 U	5 U	5 U
Bromodichloromethane	5 U	5 U	5 U	5 U	5 U	5 U
Bromoform	5 U	5 U	5 U	5 U	5 U	5 U
Bromomethane	10 U	10 U	10 U	10 U	10 U	10 U
2-Butanone	20 U	20 U	20 U	20 U	20 U	20 U
Carbon Disulfide	5 U	5 U	5 U	5 U	5 U	5 U
Carbon Tetrachloride	5 U	5 U	5 U	5 U	5 U	5 U
Chlorobenzene	5 U	5 U	5 U	5 U	5 U	5 U
Chloroethane	10 U	10 U	10 U	10 U	10 U	10 U
2-Chloroethylvinylether	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	5 U	5 U	5 U	5 U	5 U	5 U
Chloromethane	10 U	10 U	10 U	10 U	10 U	10 U
Dibromochloromethane	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethane	5 U	5 U	5 U	5 U	5 U	5 U
1,1,1-Dichloroethene	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethane	5 U	5 U	5 U	5 U	5 U	5 U
total-1,2-Dichloroethene	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloropropane	5 U	5 U	5 U	5 U	5 U	5 U
cis-1,3-Dichloropropene	5 U	5 U	5 U	5 U	5 U	5 U
trans-1,3-Dichloropropene	5 U	5 U	5 U	5 U	5 U	5 U
Ethylbenzene	5 U	5 U	5 U	5 U	5 U	5 U
2-Hexanone	10 U	10 U	10 U	10 U	10 U	10 U
Methylene Chloride	5 U	5 U	5 U	5 U	5 U	5 U
4-Methyl-2-Pentanone	10 U	10 U	10 U	10 U	10 U	10 U
Styrene	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	5 U	5 U	5 U	5 U	5 U	5 U
Tetrachloroethene	5 U	5 U	5 U	5 U	5 U	5 U
Toluene	5 U	5 U	5 U	5 U	5 U	5 U
1,1,1-Trichloroethane	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane	5 U	5 U	5 U	5 U	5 U	5 U
Trichloroethene	5 U	5 U	5 U	5 U	5 U	5 U
Trichlorofluoromethane	5 U	5 U	5 U	5 U	5 U	5 U
Vinyl Acetate	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl Chloride	10 U	10 U	10 U	10 U	10 U	10 U
Xylenes (total)	5 U	5	5 U	5 U	230	5 U

Volatile Soil Analytical Results for Site No. 25 Duluth Air National Guard Base, Duluth, Minnesota (Results in micrograms per kilogram unless otherwise noted)

Location No.:	025-009BH 11-12 Dup	025-009BH 14-14.5	025-010BH 2-2.5	025-010BH 6-6.5	025-011BH 2-2.5	025-011BH 6.5-7
Sample Date:	05/12/95	05/12/95	05/12/95	05/12/95	05/12/95	05/12/95
Lab Sample No.:	9505512-09	9505512-11	9505512-04	9505512-05	9505512-06	9505512-07
VOCs	Matrix	Soil	Soil	Soil	Soil	Soil
Acetone	100 U	100 U	100 U	100 U	100 U	100 U
Benzene	5 U	5 U	5 U	5 U	5 U	5 U
Bromodichloromethane	5 U	5 U	5 U	5 U	5 U	5 U
Bromoform	5 U	5 U	5 U	5 U	5 U	5 U
Bromomethane	10 U	10 U	10 U	10 U	10 U	10 U
2-Butanone	20 U	20 U	20 U	20 U	20 U	20 U
Carbon Disulfide	5 U	5 U	5 U	5 U	5 U	5 U
Carbon Tetrachloride	5 U	5 U	5 U	5 U	5 U	5 U
Chlorobenzene	5 U	5 U	5 U	5 U	5 U	5 U
Chloroethane	10 U	10 U	10 U	10 U	10 U	10 U
2-Chloroethylvinylether	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	5 U	5 U	5 U	5 U	5 U	5 U
Chloromethane	10 U	10 U	10 U	10 U	10 U	10 U
Dibromochloromethane	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethane	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethane	5 U	5 U	5 U	5 U	5 U	5 U
total-1,2-Dichloroethene	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloropropane	5 U	5 U	5 U	5 U	5 U	5 U
cis-1,3-Dichloropropene	5 U	5 U	5 U	5 U	5 U	5 U
trans-1,3-Dichloropropene	5 U	5 U	5 U	5 U	5 U	5 U
Ethylbenzene	5 U	5 U	5 U	7	5 U	5 U
2-Hexanone	10 U	10 U	10 U	10 U	10 U	10 U
Methylene Chloride	5 U	5 U	5 U	5 U	5 U	5 U
4-Methyl-2-Pentanone	10 U	10 U	10 U	10 U	10 U	10 U
Styrene	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	5 U	5 U	5 U	5 U	5 U	5 U
Tetrachloroethene	5 U	5 U	5 U	5 U	5 U	5 U
Toluene	5 U	5 U	5 U	17	5 U	5 U
1,1,1-Trichloroethane	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane	5 U	5 U	5 U	5 U	5 U	5 U
Trichloroethene	5 U	5 U	5 U	5 U	5 U	5 U
Trichlorofluoromethane	5 U	5 U	5 U	5 U	5 U	5 U
Vinyl Acetate	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl Chloride	10 U	10 U	10 U	10 U	10 U	10 U
Xylenes (total)	5 U	8	5 U	5	5 U	6

BH - Borehole

VOC - Volatile Organic Compounds

U - Indicates compound was analyzed for but not detected

Appendix K.1

Volatile Soil Analytical Results for Site No. 25 Duluth Air National Guard Base, Duluth, Minnesota

(Results in micrograms per kilogram unless otherwise noted)

Location No.:	025-012BH 11.5-12	025-012BH 19.5-20	025-013BH 11.5-12
Sample Date:	5/17/95	5/17/95	5/17/95
Lab Sample No.:	9505673-02	9505673-03	9505673-04
VOCs	Matrix	Soil	Soil
Acetone		100 U	100 U
Benzene		29	5 U
Bromodichloromethane		5 U	5 U
Bromoform		5 U	5 U
Bromomethane		10 U	10 U
2-Butanone		20 U	20 U
Carbon Disulfide		5 U	5 U
Carbon Tetrachloride		5 U	5 U
Chlorobenzene		5 U	5 U
Chloroethane		10 U	10 U
2-Chloroethylvinylether		10 U	10 U
Chloroform		5 U	5 U
Chloromethane		10 U	10 U
Dibromochloromethane		5 U	5 U
1,1-Dichloroethane		5 U	5 U
1,1-Dichloroethene		5 U	5 U
1,2-Dichloroethane		5 U	5 U
total-1,2-Dichloroethene		5 U	5 U
1,2-Dichloropropane		5 U	5 U
cis-1,3-Dichloropropene		5 U	5 U
trans-1,3-Dichloropropene		5 U	5 U
Ethylbenzene		5 U	5 U
2-Hexanone		10 U	10 U
Methylene Chloride		5 U	5 U
4-Methyl-2-Pentanone		10 U	10 U
Styrene		5 U	5 U
1,1,2,2-Tetrachloroethane		5 U	5 U
Tetrachloroethene		5 U	5 U
Toluene	8	5 U	5 U
1,1,1-Trichloroethane	5 U	5 U	5 U
1,1,2-Trichloroethane	5 U	5 U	5 U
Trichloroethene	5 U	5 U	5 U
Trichlorofluoromethane	5 U	5 U	5 U
Vinyl Acetate	10 U	10 U	10 U
Vinyl Chloride	10 U	10 U	10 U
Xylenes (total)	11	5 U	5 U

Semivolatile Soil Analytical Results for Site No. 25
Duluth Air National Guard Base, Duluth, Minnesota
 (Results in micrograms per kilogram unless otherwise noted)

Location No.:	025-001BH 6.5-7	025-002BH 11.5-12	025-003BH 11.5-12	025-004BH 11.5-12	025-004BH 11.5-12	025-004BH 19.5-20
Sample Date:	05/15/95	05/15/95	05/15/95	05/15/95	05/15/95	05/16/95
Lab Sample No.:	9505556-02	9505556-03	9505556-04	9505556-05	9505556-05	9505612-06
SVOCs	Matrix	Soil	Soil	Soil	Soil	Soil
Acenaphthene	330 U	330 U	330 U	330 U	330 U	330 U
Acenaphthylene	330 U	330 U	330 U	330 U	330 U	330 U
Aniline	330 U	330 U	330 U	330 U	330 U	330 U
Anthracene	330 U	330 U	330 U	330 U	330 U	330 U
Benzo(a)Anthracene	330 U	330 U	330 U	330 U	330 U	330 U
Benzo(b)Fluoranthene	330 U	330 U	330 U	330 U	330 U	330 U
Benzo(k)Fluoranthene	330 U	330 U	330 U	330 U	330 U	330 U
Benzo(a)Pyrene	330 U	330 U	330 U	330 U	330 U	330 U
Benzoic Acid	1600 U	1600 U	1600 U	1600 U	1600 U	1600 U
Benzo(g,h,i)Perylene	330 U	330 U	330 U	330 U	330 U	330 U
Benzy alcohol	330 U	330 U	330 U	330 U	330 U	330 U
4-Bromophenylphenyl ether	330 U	330 U	330 U	330 U	330 U	330 U
Butylbenzylphthalate	330 U	330 U	330 U	330 U	330 U	330 U
di-n-Butyl phthalate	330 U	330 U	330 U	330 U	330 U	330 U
Carbazole	330 U	330 U	330 U	330 U	330 U	330 U
4-Chloroaniline	330 U	330 U	330 U	330 U	330 U	330 U
bis(2-Chloroethoxy)Methane	330 U	330 U	330 U	330 U	330 U	330 U
bis(2-Chloroethyl)Ether	330 U	330 U	330 U	330 U	330 U	330 U
bis(2-Chloroisopropyl)Ether	330 U	330 U	330 U	330 U	330 U	330 U
4-Chloro-3-Methylphenol	330 U	330 U	330 U	330 U	330 U	330 U
2-Chloronaphthalene	330 U	330 U	330 U	330 U	330 U	330 U
2-Chlorophenol	330 U	330 U	330 U	330 U	330 U	330 U
4-Chlorophenylphenyl ether	330 U	330 U	330 U	330 U	330 U	330 U
Chrysene	330 U	330 U	330 U	330 U	330 U	330 U
Dibenz(a,h)Anthracene	330 U	330 U	330 U	330 U	330 U	330 U
Dibenzofuran	330 U	330 U	330 U	330 U	330 U	330 U
1,2-Dichlorobenzene	330 U	330 U	330 U	330 U	330 U	330 U
1,3-Dichlorobenzene	330 U	330 U	330 U	330 U	330 U	330 U
1,4-Dichlorobenzene	330 U	330 U	330 U	330 U	330 U	330 U
3,3'-Dichlorobenzidine	330 U	330 U	330 U	330 U	330 U	330 U
2,4-Dichlorophenol	330 U	330 U	330 U	330 U	330 U	330 U
Diethylphthalate	330 U	330 U	330 U	330 U	330 U	330 U
2,4-Dimethylphenol	330 U	330 U	330 U	330 U	330 U	330 U
Dimethyl Phthalate	330 U	330 U	330 U	330 U	330 U	330 U

BH - Borehole

SVOC - Semivolatile Organic Compounds

U - Indicates compound was analyzed for but not detected

Appendix K.2
Semivolatile Soil Analytical Results for Site No. 25
Duluth Air National Guard Base, Duluth, Minnesota
 (Results in micrograms per kilogram unless otherwise noted)

Location No.	025-001BH 6.5-7	025-002BH 11.5-12	025-003BH 11-12	025-003BH 11-12 Dup	025-004BH 11.5-12	025-004BH 19.5-20
Sample Date:	05/15/95	05/15/95	05/15/95	05/15/95	05/16/95	05/16/95
Lab Sample No.:	9505556-02	9505556-03	9505556-04	9505556-05	9505612-05	9505612-06
SVOCs	Matrix	Soil	Soil	Soil	Soil	Soil
4,6-Dinitro-2-Methylphenol	800 U	800 U	800 U	800 U	800 U	800 U
2,4-Dinitrophenol	800 U	800 U	800 U	800 U	800 U	800 U
2,4-Dinitrotoluene	330 U	330 U	330 U	330 U	330 U	330 U
2,6-Dinitrotoluene	330 U	330 U	330 U	330 U	330 U	330 U
1,2-Diphenylhydrazine	330 U	330 U	330 U	330 U	330 U	330 U
bis(2-Ethylhexyl)Phthalate	330 U	330 U	330 U	330 U	330 U	330 U
Fluoranthene	330 U	330 U	330 U	330 U	330 U	330 U
Fluorene	330 U	330 U	330 U	330 U	330 U	330 U
Hexachlorobenzene	330 U	330 U	330 U	330 U	330 U	330 U
Hexachlorobutadiene	330 U	330 U	330 U	330 U	330 U	330 U
Hexachloroethane	330 U	330 U	330 U	330 U	330 U	330 U
Hexachlorocyclopentadiene	330 U	330 U	330 U	330 U	330 U	330 U
Indeno(1,2,3-cd)Pyrene	330 U	330 U	330 U	330 U	330 U	330 U
Isophorone	330 U	330 U	330 U	330 U	330 U	330 U
2-Methylnaphthalene	12000	2300	330 U	330	330 U	330 U
2-Methylphenol	330 U	330 U	330 U	330 U	330 U	330 U
4-Methylphenol	330 U	330 U	330 U	330 U	330 U	330 U
Naphthalene	14000	2100	330 U	330 U	330 U	330 U
2-Nitroaniline	800 U	800 U	800 U	800 U	800 U	800 U
3-Nitroaniline	800 U	800 U	800 U	800 U	800 U	800 U
4-Nitroaniline	800 U	800 U	800 U	800 U	800 U	800 U
Nitrobenzene	330 U	330 U	330 U	330 U	330 U	330 U
2-Nitrophenol	330 U	330 U	330 U	330 U	330 U	330 U
4-Nitrophenol	800 U	800 U	800 U	800 U	800 U	800 U
N-Nitrosodiphenylamine (1)	330 U	330 U	330 U	330 U	330 U	330 U
N-Nitroso-Di-n-Propylamine	330 U	330 U	330 U	330 U	330 U	330 U
Di-n-Octyl Phthalate	330 U	330 U	330 U	330 U	330 U	330 U
Pentachlorophenol	800 U	800 U	800 U	800 U	800 U	800 U
Phenanthrene	330 U	330 U	330 U	330 U	330 U	330 U
Phenol	350	330 U	330 U	330 U	330 U	330 U
Pyrene	330 U	330 U	330 U	330 U	330 U	330 U
Pyridine	330 U	330 U	330 U	330 U	330 U	330 U
1,2,4-Trichlorobenzene	330 U	330 U	330 U	330 U	330 U	330 U
2,4,5-Trichlorophenol	800 U	800 U	800 U	800 U	800 U	800 U
2,4,6-Trichlorophenol	330 U	330 U	330 U	330 U	330 U	330 U

BH - Borehole
 SVOC - Semivolatile Organic Compounds

U - Indicates compound was analyzed for but not detected

Semivolatle Soil Analytical Results for Site No. 25

Duluth Air National Guard Base, Duluth, Minnesota

(Results in micrograms per kilogram unless otherwise noted)

Location No.:	025-005BH-11-5-12	025-006BH-21-5-22	025-07BH-11-5-12	025-008BH-10-5-11-0	025-008BH-14-5-15-0	025-009BH-11-12
Sample Date:	05/16/95	05/12/95	05/16/95	05/12/95	05/12/95	05/12/95
Lab Sample No.:	9505612-04	9505512-08	9505612-03	9505512-02	9505512-03	9505512-10
SVOCs	Matrix	Soil	Soil	Soil	Soil	Soil
Acenaphthene	330 U	990 U	330 U	330 U	330 U	330 U
Acenaphthylene	330 U	990 U	330 U	330 U	330 U	330 U
Aniline	330 U	990 U	330 U	330 U	330 U	330 U
Anthracene	330 U	990 U	330 U	330 U	330 U	330 U
Benzo(a)Anthracene	330 U	990 U	330 U	330 U	330 U	330 U
Benzo(b)Fluoranthene	330 U	990 U	330 U	330 U	330 U	330 U
Benzo(k)Fluoranthene	330 U	990 U	330 U	330 U	330 U	330 U
Benzo(a)Pyrene	330 U	990 U	330 U	330 U	330 U	330 U
Benzoic Acid	1600 U	4800 U	1600 U	1600 U	1600 U	1600 U
Benzo(g,h,i)Perylene	330 U	990 U	330 U	330 U	330 U	330 U
Benzyl alcohol	330 U	990 U	330 U	330 U	330 U	330 U
4-Bromophenylphenyl ether	330 U	990 U	330 U	330 U	330 U	330 U
Butylbenzylphthalate	330 U	990 U	330 U	330 U	330 U	330 U
di-n-Butyl phthalate	330 U	990 U	330 U	330 U	330 U	330 U
Carbazole	330 U	990 U	330 U	330 U	330 U	330 U
4-Chloroaniline	330 U	990 U	330 U	330 U	330 U	330 U
bis(2-Chloroethoxy)Methane	330 U	990 U	330 U	330 U	330 U	330 U
bis(2-Chloroethyl)Ether	330 U	990 U	330 U	330 U	330 U	330 U
bis(2-Chloroisopropyl)Ether	330 U	990 U	330 U	330 U	330 U	330 U
4-Chloro-3-Methylphenol	330 U	990 U	330 U	330 U	330 U	330 U
2-Chloronaphthalene	330 U	990 U	330 U	330 U	330 U	330 U
2-Chlorophenol	330 U	990 U	330 U	330 U	330 U	330 U
4-Chlorophenylphenyl ether	330 U	990 U	330 U	330 U	330 U	330 U
Chrysene	330 U	990 U	330 U	330 U	330 U	330 U
Dibenz(a,h)Anthracene	330 U	990 U	330 U	330 U	330 U	330 U
Dibenzofuran	330 U	990 U	330 U	330 U	330 U	330 U
1,2-Dichlorobenzene	330 U	990 U	330 U	330 U	330 U	330 U
1,3-Dichlorobenzene	330 U	990 U	330 U	330 U	330 U	330 U
1,4-Dichlorobenzene	330 U	990 U	330 U	330 U	330 U	330 U
3,3'-Dichlorobenzidine	330 U	990 U	330 U	330 U	330 U	330 U
2,4-Dichlorophenol	330 U	990 U	330 U	330 U	330 U	330 U
Diethylphthalate	330 U	990 U	330 U	330 U	330 U	330 U
2,4-Dimethylphenol	330 U	990 U	330 U	330 U	330 U	330 U
Dimethyl Phthalate	330 U	990 U	330 U	330 U	330 U	330 U

BH - Borehole
SVOC - Semivolatle Organic Compounds

U - Indicates compound was analyzed for but not detected

Appendix K.2

Semivolatile Soil Analytical Results for Site No. 25

Duluth Air National Guard Base, Duluth, Minnesota

(Results in micrograms per kilogram unless otherwise noted)

Location No.:	025-005BH-11.5-12	025-006BH-21.5-22	025-07BH-11.5-12	025-008BH-10.5-11.0	025-008BH-14.5-15.0	025-009BH-11-12
Sample Date:	05/16/95	05/12/95	05/16/95	05/12/95	05/12/95	05/12/95
Lab Sample No.:	9505612-04	9505512-08	9505612-03	9505512-02	9505512-03	9505512-10
SVOCs	Matrix	Soil	Soil	Soil	Soil	Soil
4,6-Dinitro-2-Methylphenol	800 U	2400 U	800 U	800 U	800 U	800 U
2,4-Dinitrophenol	800 U	2400 U	800 U	800 U	800 U	800 U
2,4-Dinitrotoluene	330 U	990 U	330 U	330 U	330 U	330 U
2,6-Dinitrotoluene	330 U	990 U	330 U	330 U	330 U	330 U
1,2-Diphenylhydrazine	330 U	990 U	330 U	330 U	330 U	330 U
bis(2-Ethylhexyl)Phthalate	330 U	990 U	330 U	330 U	330 U	330 U
Fluoranthene	330 U	990 U	330 U	330 U	330 U	330 U
Fluorene	330 U	990 U	330 U	330 U	330 U	330 U
Hexachlorobenzene	330 U	990 U	330 U	330 U	330 U	330 U
Hexachlorobutadiene	330 U	990 U	330 U	330 U	330 U	330 U
Hexachloroethane	330 U	990 U	330 U	330 U	330 U	330 U
Hexachlorocyclopentadiene	330 U	990 U	330 U	330 U	330 U	330 U
Indeno(1,2,3-cd)Pyrene	330 U	990 U	330 U	330 U	330 U	330 U
Isophorone	330 U	990 U	330 U	330 U	330 U	330 U
2-Methylnaphthalene	330 U	990 U	330 U	330 U	330 U	330 U
2-Methylphenol	330 U	990 U	330 U	330 U	330 U	330 U
4-Methylphenol	330 U	990 U	330 U	330 U	330 U	330 U
Naphthalene	330 U	990 U	330 U	330 U	330 U	330 U
2-Nitroaniline	800 U	2400 U	800 U	800 U	800 U	800 U
3-Nitroaniline	800 U	2400 U	800 U	800 U	800 U	800 U
4-Nitroaniline	800 U	2400 U	800 U	800 U	800 U	800 U
Nitrobenzene	330 U	990 U	330 U	330 U	330 U	330 U
2-Nitrophenol	330 U	990 U	330 U	330 U	330 U	330 U
4-Nitrophenol	800 U	2400 U	800 U	800 U	800 U	800 U
N-Nitrosodiphenylamine (1)	330 U	990 U	330 U	330 U	330 U	330 U
N-Nitroso-Di-n-Propylamine	330 U	990 U	330 U	330 U	330 U	330 U
Di-n-Octyl Phthalate	330 U	990 U	330 U	330 U	330 U	330 U
Pentachlorophenol	800 U	2400 U	800 U	800 U	800 U	800 U
Phenanthrene	330 U	990 U	330 U	330 U	330 U	330 U
Phenol	330 U	990 U	330 U	330 U	330 U	330 U
Pyrene	330 U	990 U	330 U	330 U	330 U	330 U
Pyridine	330 U	990 U	330 U	330 U	330 U	330 U
1,2,4-Trichlorobenzene	330 U	990 U	330 U	330 U	330 U	330 U
2,4,5-Trichlorophenol	800 U	2400 U	800 U	800 U	800 U	800 U
2,4,6-Trichlorophenol	330 U	990 U	330 U	330 U	330 U	330 U

BH - Borehole

SVOC - Semivolatile Organic Compounds

U - Indicates compound was analyzed for but not detected

Semivolatile Soil Analytical Results for Site No. 25

Duluth Air National Guard Base, Duluth, Minnesota

(Results in micrograms per kilogram unless otherwise noted)

Location No.	025-009BH 11-12 Dup	025-009BH 14-14.5	025-010BH 2-2.5	025-010BH 6-6.5	025-011BH 2-2.5	025-011BH 6.5-7
Sample Date:	05/12/95	05/12/95	05/12/95	05/12/95	05/12/95	05/12/95
Lab Sample No.:	9505512-09	9505512-11	9505512-04	9505512-05	9505512-06	9505512-07
SVOCs	Matrix	Soil	Soil	Soil	Soil	Soil
Acenaphthene	330 U	330 U	330 U	330 U	330 U	3300 U
Acenaphthylene	330 U	330 U	330 U	330 U	330 U	3300 U
Aniline	330 U	330 U	330 U	330 U	330 U	3300 U
Anthracene	330 U	330 U	330 U	330 U	330 U	3300 U
Benzo(a)Anthracene	330 U	330 U	330 U	330 U	330 U	3300 U
Benzo(b)Fluoranthene	330 U	330 U	330 U	330 U	330 U	3300 U
Benzo(k)Fluoranthene	330 U	330 U	330 U	330 U	330 U	3300 U
Benzo(a)Pyrene	330 U	330 U	330 U	330 U	330 U	3300 U
Benzoic Acid	1600 U	1600 U	1600 U	1600 U	1600 U	16000 U
Benzo(g,h,i)Perylene	330 U	330 U	330 U	330 U	330 U	3300 U
Benzyl alcohol	330 U	330 U	330 U	330 U	330 U	3300 U
4-Eromophenylphenyl ether	330 U	330 U	330 U	330 U	330 U	3300 U
Butylbenzylphthalate	330 U	330 U	330 U	330 U	330 U	3300 U
di-n-Butyl phthalate	330 U	330 U	330 U	330 U	330 U	3300 U
Carbazole	330 U	330 U	330 U	330 U	330 U	3300 U
4-Chloroaniline	330 U	330 U	330 U	330 U	330 U	3300 U
bis(2-Chloroethoxy)Methane	330 U	330 U	330 U	330 U	330 U	3300 U
bis(2-Chloroethyl)Ether	330 U	330 U	330 U	330 U	330 U	3300 U
bis(2-Chloroisopropyl)Ether	330 U	330 U	330 U	330 U	330 U	3300 U
4-Chloro-3-Methylphenol	330 U	330 U	330 U	330 U	330 U	3300 U
2-Chloronaphthalene	330 U	330 U	330 U	330 U	330 U	3300 U
2-Chlorophenol	330 U	330 U	330 U	330 U	330 U	3300 U
4-Chlorophenylphenyl ether	330 U	330 U	330 U	330 U	330 U	3300 U
Chrysene	330 U	330 U	330 U	330 U	330 U	3300 U
Dibenz(a,h)Anthracene	330 U	330 U	330 U	330 U	330 U	3300 U
Dibenzofuran	330 U	330 U	330 U	330 U	330 U	3300 U
1,2-Dichlorobenzene	330 U	330 U	330 U	330 U	330 U	3300 U
1,3-Dichlorobenzene	330 U	330 U	330 U	330 U	330 U	3300 U
1,4-Dichlorobenzene	330 U	330 U	330 U	330 U	330 U	3300 U
3,3'-Dichlorobenzidine	330 U	330 U	330 U	330 U	330 U	3300 U
2,4-Dichlorophenol	330 U	330 U	330 U	330 U	330 U	3300 U
Diethylphthalate	330 U	330 U	330 U	330 U	330 U	3300 U
2,4-Dimethylphenol	330 U	330 U	330 U	330 U	330 U	3300 U
Dimethyl Phthalate	330 U	330 U	330 U	330 U	330 U	3300 U

BH - Borehole

SVOC - Semivolatile Organic Compounds

U - Indicates compound was analyzed for but not detected

Appendix K.2
Semivolatile Soil Analytical Results for Site No. 25
Duluth Air National Guard Base, Duluth, Minnesota
 (Results in micrograms per kilogram unless otherwise noted)

Location No.	025-009BH 11-12 Dup	025-009BH 14-14.5	025-010BH 2-2.5	025-010BH 6-6.5	025-011BH 2-2.5	025-011BH 6.5-7
Sample Date:	05/12/95	05/12/95	05/12/95	05/12/95	05/12/95	05/12/95
Lab Sample No.	9505512-09	9505512-11	9505512-04	9505512-05	9505512-06	9505512-07
SVOCs	Matrix	Soil	Soil	Soil	Soil	Soil
4,6-Dinitro-2-Methylphenol	800 U	800 U	800 U	800 U	800 U	8000 U
2,4-Dinitrophenol	800 U	800 U	800 U	800 U	800 U	8000 U
2,4-Dinitrotoluene	330 U	330 U	330 U	330 U	330 U	3300 U
2,6-Dinitrotoluene	330 U	330 U	330 U	330 U	330 U	3300 U
1,2-Diphenylhydrazine	330 U	330 U	330 U	330 U	330 U	3300 U
bis(2-Ethylhexyl)Phthalate	330 U	330 U	330 U	330 U	330 U	3300 U
Fluoranthene	330 U	330 U	420	330 U	330 U	3300 U
Fluorene	330 U	330 U	330 U	330 U	330 U	3300 U
Hexachlorobenzene	330 U	330 U	330 U	330 U	330 U	3300 U
Hexachlorobutadiene	330 U	330 U	330 U	330 U	330 U	3300 U
Hexachloroethane	330 U	330 U	330 U	330 U	330 U	3300 U
Hexachlorocyclopentadiene	330 U	330 U	330 U	330 U	330 U	3300 U
Indeno(1,2,3-cd)Pyrene	330 U	330 U	330 U	330 U	330 U	3300 U
Isophorone	330 U	330 U	330 U	330 U	330 U	3300 U
2-Methylnaphthalene	330 U	330 U	330 U	330 U	330 U	3300 U
2-Methylphenol	330 U	330 U	330 U	330 U	330 U	3300 U
4-Methylphenol	330 U	330 U	330 U	330 U	330 U	3300 U
Naphthalene	330 U	330 U	330 U	330 U	330 U	3300 U
2-Nitroaniline	800 U	800 U	800 U	800 U	800 U	8000 U
3-Nitroaniline	800 U	800 U	800 U	800 U	800 U	8000 U
4-Nitroaniline	800 U	800 U	800 U	800 U	800 U	8000 U
Nitrobenzene	330 U	330 U	330 U	330 U	330 U	3300 U
2-Nitrophenol	330 U	330 U	330 U	330 U	330 U	3300 U
4-Nitrophenol	800 U	800 U	800 U	800 U	800 U	8000 U
N-Nitrosodiphenylamine (1)	330 U	330 U	330 U	330 U	330 U	3300 U
N-Nitroso-Di-n-Propylamine	330 U	330 U	330 U	330 U	330 U	3300 U
Di-n-Octyl Phthalate	330 U	330 U	330 U	330 U	330 U	3300 U
Pentachlorophenol	800 U	800 U	800 U	800 U	800 U	8000 U
Phenanthrene	330 U	330 U	330 U	330 U	330 U	3300 U
Phenol	330 U	330 U	330 U	330 U	330 U	3300 U
Pyrene	330 U	330 U	360	330 U	330 U	3300 U
Pyridine	330 U	330 U	330 U	330 U	330 U	3300 U
1,2,4-Trichlorobenzene	330 U	330 U	330 U	330 U	330 U	3300 U
2,4,5-Trichlorophenol	800 U	800 U	800 U	800 U	800 U	8000 U
2,4,6-Trichlorophenol	330 U	330 U	330 U	330 U	330 U	3300 U

BH - Borehole

SVOC - Semivolatile Organic Compounds

U - Indicates compound was analyzed for but not detected

Semivolatile Soil Analytical Results for Site No. 25

Duluth Air National Guard Base, Duluth, Minnesota

(Results in micrograms per kilogram unless otherwise noted)

Location No.	025-012BH 11.5-12	025-012BH 19.5-20	025-013BH 11.5-12
Sample Date	5/17/95	5/17/95	5/17/95
Lab Sample No.	9505673-02	9505673-03	9505673-04
SVOCs	Matrix	Soil	Soil
Acenaphthene	330 U	330 U	330 U
Acenaphthylene	330 U	330 U	330 U
Aniline	330 U	330 U	330 U
Anthracene	330 U	330 U	330 U
Benzo(a)Anthracene	330 U	330 U	330 U
Benzo(b)Fluoranthene	330 U	330 U	330 U
Benzo(k)Fluoranthene	330 U	330 U	330 U
Benzo(a)Pyrene	330 U	330 U	330 U
Benzoic Acid	1600 U	1600 U	1600 U
Benzo(g,h,i)Perylene	330 U	330 U	330 U
Benzyl alcohol	330 U	330 U	330 U
4-Bromophenylphenyl ether	330 U	330 U	330 U
Butylbenzylphthalate	330 U	330 U	330 U
di-n-Butyl phthalate	330 U	330 U	330 U
Carbazole	330 U	330 U	330 U
4-Chloroaniline	330 U	330 U	330 U
bis(2-Chloroethoxy)Methane	330 U	330 U	330 U
bis(2-Chloroethyl)Ether	330 U	330 U	330 U
bis(2-Chloroisopropyl)Ether	330 U	330 U	330 U
4-Chloro-3-Methylphenol	330 U	330 U	330 U
2-Chloronaphthalene	330 U	330 U	330 U
2-Chlorophenol	330 U	330 U	330 U
4-Chlorophenylphenyl ether	330 U	330 U	330 U
Chrysene	330 U	330 U	330 U
Dibenz(a,h)Anthracene	330 U	330 U	330 U
Dibenzofuran	330 U	330 U	330 U
1,2-Dichlorobenzene	330 U	330 U	330 U
1,3-Dichlorobenzene	330 U	330 U	330 U
1,4-Dichlorobenzene	330 U	330 U	330 U
3,3'-Dichlorobenzidine	330 U	330 U	330 U
2,4-Dichlorophenol	330 U	330 U	330 U
Diethylphthalate	330 U	330 U	330 U
2,4-Dimethylphenol	330 U	330 U	330 U
Dimethyl Phthalate	330 U	330 U	330 U

BH - Borehole

SVOC - Semivolatile Organic Compounds

U - Indicates compound was analyzed for but not detected

Appendix K.2

Semivolatile Soil Analytical Results for Site No. 25 Duluth Air National Guard Base, Duluth, Minnesota

(Results in micrograms per kilogram unless otherwise noted)

Location No.	025-012BH 11-S-12	025-012BH 19-S-20	025-013BH 11-S-12
Sample Date:	5/17/95	5/17/95	5/17/95
Lab Sample No.:	9505673-02	9505673-03	9505673-04
SVOCs	Matrix	Soil	Soil
4,6-Dinitro-2-Methylphenol	800 U	800 U	800 U
2,4-Dinitrophenol	800 U	800 U	800 U
2,4-Dinitrotoluene	330 U	330 U	330 U
2,6-Dinitrotoluene	330 U	330 U	330 U
1,2-Diphenylhydrazine	330 U	330 U	330 U
bis(2-Ethylhexyl)Phthalate	330 U	330 U	330 U
Fluoranthene	330 U	330 U	330 U
Fluorene	330 U	330 U	330 U
Hexachlorobenzene	330 U	330 U	330 U
Hexachlorobutadiene	330 U	330 U	330 U
Hexachloroethane	330 U	330 U	330 U
Hexachlorocyclopentadiene	330 U	330 U	330 U
Indeno(1,2,3-cd)Pyrene	330 U	330 U	330 U
Isophorone	330 U	330 U	330 U
2-Methylnaphthalene	330 U	330 U	330 U
2-Methylphenol	330 U	330 U	330 U
4-Methylphenol	330 U	330 U	330 U
Naphthalene	330 U	330 U	330 U
2-Nitroaniline	800 U	800 U	800 U
3-Nitroaniline	800 U	800 U	800 U
4-Nitroaniline	800 U	800 U	800 U
Nitrobenzene	330 U	330 U	330 U
2-Nitrophenol	330 U	330 U	330 U
4-Nitrophenol	800 U	800 U	800 U
N-Nitrosodiphenylamine (1)	330 U	330 U	330 U
N-Nitroso-Di-n-Propylamine	330 U	330 U	330 U
Di-n-Octyl Phthalate	330 U	330 U	330 U
Pentachlorophenol	800 U	800 U	800 U
Phenanthrene	330 U	330 U	330 U
Phenol	330 U	330 U	330 U
Pyrene	330 U	330 U	330 U
Pyridine	330 U	330 U	330 U
1,2,4-Trichlorobenzene	330 U	330 U	330 U
2,4,5-Trichlorophenol	800 U	800 U	800 U
2,4,6-Trichlorophenol	330 U	330 U	330 U

Appendix K.3
Metals Soil Analytical Results for Site No.25
Duluth Air National Guard Base, Duluth, Minnesota
 (Results in milligrams per kilogram unless otherwise noted)

Location No.:	025-001BH 6.5-7	025-002BH 11.5-12	025-003BH 11-12	025-003BH 11-12 Dup	025-004BH 11.5-12
Sample Date:	05/15/95	05/15/95	05/15/95	05/15/95	05/16/95
Lab Sample No.:	9505556-02	9505556-03	9505556-04	9505556-05	9505612-05
Metals	Matri	Soil	Soil	Soil	Soil
Mercury, Total	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Cadmium, Total	0.4 U	0.4 U	0.4 U	0.5	0.5 U
Chromium, Total	9	6	15	11	9
Nickel, Total	25	21	22	26	17
Lead, Total	3.2	1.7	3.0	2.6	2.0

Location No.:	025-004BH 19.5-20	025-005BH 11.5-12	025-006BH 21.5-22	025-007BH 11.5-12	025-008BH 10.5-11.0
Sample Date:	05/16/95	05/16/95	05/12/95	05/16/95	05/12/95
Lab Sample No.:	9505612-06	9505612-04	9505512-08	9505612-03	9505512-02
Metals	Matri	Soil	Soil	Soil	Soil
Mercury, Total	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Cadmium, Total	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chromium, Total	18	6	16	6	18
Nickel, Total	23	17	18	16	26
Lead, Total	4.5	1.9	7.6	6.1	4.6

BH - Borehole

U - Indicates element was analyzed for but not detected

Appendix K.3
Metals Soil Analytical Results for Site No.25
Duluth Air National Guard Base, Duluth, Minnesota
 (Results in milligrams per kilogram unless otherwise noted)

Location No.:	025-008BH 14.5-15:0	025-009BH 11-12	025-009BH 11-12 Dup	025-009BH 14-14.5	025-010BH 2-2.5
Sample Date:	05/12/95	05/12/95	05/12/95	05/12/95	05/12/95
Lab Sample No.:	9505512-03	9505512-10	9505512-09	9505512-11	9505512-04
Metals	Matri	Soil	Soil	Soil	Soil
Mercury, Total	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Cadmium, Total	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chromium, Total	12	18	24	17	15
Nickel, Total	27	19	22	18	20
Lead, Total	6.8	5.5	5.8	3.8	4.6

Location No.:	025-010BH 6-6.5	025-011BH 2-2.5	025-011BH 6.5-7	025-012BH 11.5-12	025-012BH 19.5-20
Sample Date:	05/12/95	05/12/95	5/12/95	5/17/95	5/17/95
Lab Sample No.:	9505512-05	9505512-06	9505512-07	9505673-02	9505673-03
Metals	Matri	Soil	Soil	Soil	Soil
Mercury, Total	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Cadmium, Total	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chromium, Total	19	19	17	11	13
Nickel, Total	25	21	18	15	9
Lead, Total	3.6	5.2	6.3	4.3	5.3

Location No.:	025-013BH 11.5-12
Sample Date:	5/17/95
Lab Sample No.:	9505673-04
Metals	Matri
Mercury, Total	0.1 U
Cadmium, Total	0.5 U
Chromium, Total	6
Nickel, Total	16
Lead, Total	3.2

Appendix K.4

Halogenated Volatile Groundwater Results for Site No. 25 Duluth Air National Guard Base, Duluth, Minnesota

(Result in micrograms per liter unless otherwise noted)

Location No.:	025-001MW-GW01	025-002MW-GW1	025-003MW-GW01	025-003MW-GW01 Dup
Sample Date:	05/19/95	05/18/95	05/19/95	05/19/95
Lab Sample No.:	9505767-03	9505714-08	9505767-05	9505767-06
VOC'S (8010)	Matrix	Water	Water	Water
Dichlorodifluoromethane	1U	1U	25 U	25 U
Chloromethane	1U	1U	25 U	25 U
Vinyl chloride	1U	1U	25 U	25 U
Bromomethane	1U	1U	25 U	25 U
Chloroethane	1U	1U	25 U	25 U
Trichlorofluoromethane	1U	1U	25 U	25 U
1,1-Dichloroethene	1U	1U	25 U	25 U
Methylene chloride	1U	1U	30	25 U
Trans-1,2-Dichloroethene	1U	1U	25 U	25 U
1,1-Dichloroethane	1U	1U	25 U	25 U
chloroform	1U	1U	25 U	25 U
1,1,1-Trichloroethane	1U	1U	25 U	25 U
carbon tetrachloride	1U	1U	25 U	25 U
1,2-Dichloroethane	1U	1U	25 U	25 U
2-Chloroethylvinyl ether	1U	1U	25 U	25 U
Trichloroethene	1U	1U	25 U	25 U
1,2-Dichloropropane	1U	1U	25 U	25 U
Bromodichloromethane	1U	1U	25 U	25 U
cis-1,3-Dichloropropene	1U	1U	25 U	25 U
trans-1,3-Dichloropropene	1U	1U	25 U	25 U
1,1,2-Trichloroethane	1U	1U	25 U	25 U
Tetrachloroethene	1U	1U	25 U	25 U
Dibromochloromethane	1U	1U	25 U	25 U
Chlorobenzene	1U	1U	25 U	25 U
Bromoform	1U	1U	25 U	25 U
1,1,2,2-Tetrachloroethane	1U	1U	25 U	25 U
1,3-Dichlorobenzene	1U	1U	25 U	25 U
1,4-Dichlorobenzene	1U	1U	25 U	25 U
1,2-Dichlorobenzene	1U	1U	25 U	25 U

MW - Monitoring Well
GW - Groundwater

U - Indicates compound was analyzed for but not detected
PAH-8010 - Polynuclear Aromatic Hydrocarbon Compounds

Appendix K.4
Aromatic Volatile Groundwater Results for Site No. 25
Duluth Air National Guard Base, Duluth, Minnesota
 (Results in micrograms per liter unless otherwise noted)

Location No.:	025-001MW-GW01	025-002MW-GW1	025-003MW-GW01	025-003MW-GW01 Dup
Sample Date:	05/19/95	05/18/95	05/19/95	05/19/95
Lab Sample No.:	9505767-03	9505714-08	9505767-05	9505767-06
BTEX(8020)	Matri	Water	Water	Water
Benzene	1 U	1	2600	2300
Toluene	1 U	1 U	1300	1300
Ethylbenzene	1 U	1 U	570	540
Xylenes (total)	1 U	1 U	1450	1390

MW - Monitoring Well
 GW - Groundwater

U - Indicates compound was analyzed for but not detected
 BTEX 8020 - Volatile Organic Compounds-Method 8020

Semivolatile Groundwater Analytical Results for Site No. 25

Duluth Air National Guard Base, Duluth, Minnesota

(Results in micrograms per liter unless otherwise noted)

Location No.:	025-001MW-GW01	025-002MW-GW1	025-003MW-GW01	025-003MW-GW01 Dup
Sample Date:	05/19/95	05/18/95	05/19/95	05/19/95
Lab Sample No.:	9505767-03	9505714-08	9505767-05	9505767-06
SVOCs	Matrix	Water	Water	Water
Acenaphthene		5 U	5 U	5 U
Acenaphthylene		5 U	5 U	5 U
Aniline		5 U	5 U	5 U
Anthracene		5 U	5 U	5 U
Benzo(a)Anthracene		5 U	5 U	5 U
Benzo(b)Fluoranthene		5 U	5 U	5 U
Benzo(k)Fluoranthene		5 U	5 U	5 U
Benzo(a)Pyrene		5 U	5 U	5 U
Benzoic Acid		25 U	25 U	25 U
Benzo(g,h,i)Perylene		5 U	5 U	5 U
Benzyl alcohol		5 U	5 U	5 U
4-Bromophenylphenyl ether		5 U	5 U	5 U
Butylbenzylphthalate		5 U	5 U	5 U
di-n-Butyl phthalate		5 U	5 U	5 U
Carbazole		5 U	5 U	5 U
4-Chloroaniline		5 U	5 U	5 U
bis(2-Chloroethoxy)Methane		5 U	5 U	5 U
bis(2-Chloroethyl)Ether		5 U	5 U	5 U
bis(2-Chloroisopropyl)Ether		5 U	5 U	5 U
4-Chloro-3-Methylphenol		5 U	5 U	5 U
2-Chloronaphthalene		5 U	5 U	5 U
2-Chlorophenol		5 U	5 U	5 U
4-Chlorophenylphenyl ether		5 U	5 U	5 U
Chrysene		5 U	5 U	5 U
Dibenz(a,h)Anthracene		5 U	5 U	5 U
Dibenzofuran		5 U	5 U	5 U
1,2-Dichlorobenzene		5 U	5 U	5 U
1,3-Dichlorobenzene		5 U	5 U	5 U
1,4-Dichlorobenzene		5 U	5 U	5 U
3,3'-Dichlorobenzidine		5 U	5 U	5 U
2,4-Dichlorophenol		5 U	5 U	5 U
Diethylphthalate		5 U	5 U	5 U
2,4-Dimethylphenol		5 U	5 U	5 U
Dimethyl Phthalate		5 U	5 U	5 U
4,6-Dinitro-2-Methylphenol		25 U	25 U	25 U
2,4-Dinitrophenol		25 U	25 U	25 U

MW - Monitoring Well
GW - Groundwater

U - Indicates compound was analyzed for but not detected
SVOC - Semivolatile Organic Compounds

Appendix K.5

Semivolatile Groundwater Analytical Results for Site No. 25

Duluth Air National Guard Base, Duluth, Minnesota

(Results in micrograms per liter unless otherwise noted)

Location No.:	025-001MW-GW01	025-002MW-GW1	025-003MW-GW01	025-003MW-GW01 Dup
Sample Date:	05/19/95	05/18/95	05/19/95	05/19/95
Lab Sample No.:	9505767-03	9505714-08	9505767-05	9505767-06
SVOCs	Matrix	Water	Water	Water
2,4-Dinitrotoluene		5 U	5 U	5 U
2,6-Dinitrotoluene		5 U	5 U	5 U
1,2-Diphenylhydrazine		5 U	5 U	5 U
bis(2-Ethylhexyl)Phthalate		5 U	5 U	5 U
Fluoranthene		5 U	5 U	5 U
Fluorene		5 U	5 U	5 U
Hexachlorobenzene		5 U	5 U	5 U
Hexachlorobutadiene		5 U	5 U	5 U
Hexachloroethane		5 U	5 U	5 U
Hexachlorocyclopentadiene		5 U	5 U	5 U
Indeno(1,2,3-cd)Pyrene		5 U	5 U	5 U
Isophorone		5 U	5 U	5 U
2-Methylnaphthalene		5 U	11	8
2-Methylphenol		5 U	5 U	5 U
4-Methylphenol		5 U	9	8
Naphthalene		5 U	75	51
2-Nitroaniline		25 U	25 U	25 U
3-Nitroaniline		25 U	25 U	25 U
4-Nitroaniline		25 U	25 U	25 U
Nitrobenzene		5 U	5 U	5 U
2-Nitrophenol		25 U	25 U	25 U
4-Nitrophenol		25 U	25 U	25 U
N-Nitrosodiphenylamine (1)		5 U	5 U	5 U
N-Nitroso-Di-n-Propylamine		5 U	5 U	5 U
Di-n-Octyl Phthalate		5 U	5 U	5 U
Pentachlorophenol		25 U	25 U	25 U
Phenanthrene		5 U	5 U	5 U
Phenol		51	15	12
Pyrene		5 U	5 U	5 U
Pyridine		5 U	5 U	5 U
1,2,4-Trichlorobenzene		5 U	5 U	5 U
2,4,5-Trichlorophenol		10 U	10 U	10 U
2,4,6-Trichlorophenol		5 U	5 U	5 U

Appendix K.6

Metals Groundwater Analytical Results for Site No. 25 Duluth Air National Guard Base, Duluth, Minnesota (Results in milligrams per liter unless otherwise noted)

Location No.:	025-001MW-GW01	025-002MW-GW1	025-003MW-GW01	025-003MW-GW01 Dup
Sample Date:	05/19/95	05/18/95	05/19/95	05/19/95
Lab Sample No.:	9505767-03	9505174-08	9505767-05	9505767-06
Metals	Matri	Water	Water	Water
Mercury, Total	0.0004 U	0.0004 U	0.0004 U	0.0004 U
Cadmium, Total	0.005 U	0.005 U	0.005 U	0.005 U
Chromium, Total	0.036	0.011	0.015	0.019
Nickel, Total	0.07	0.03	0.03	0.04
Lead, Total	0.008	0.004 U	0.005	0.007

MW - Monitoring Well
GW - Groundwater

U - Indicates element was analyzed for but not detected

Appendix K.7

Volatle Soil Analytical Results for Site No. 26 Duluth Air National Guard Base, Duluth, Minnesota

(Results in micrograms per kilogram unless otherwise noted)

Location No.:	026-001BH 2-2.5	026-001BH 9.5-10	026-001BH 9.5-10 Dup	026-002BH 2-2.5	026-002BH 6.5-7	026-003BH 15-2.5
Sample Date:	05/03/95	05/03/95	05/03/95	05/04/95	05/04/95	05/04/95
Lab Sample No.:	9505164-01	9505164-02	9505164-10	9505209-04	9505209-05	9505209-02
VOCs	Soil	Soil	Soil	Soil	Soil	Soil
Matrix	Soil	Soil	Soil	Soil	Soil	Soil
Acetone	100 U	100 U	100 U	100 U	100 U	100 U
Benzene	5 U	5 U	5 U	5 U	5 U	5 U
Bromodichloromethane	5 U	5 U	5 U	5 U	5 U	5 U
Bromoform	5 U	5 U	5 U	5 U	5 U	5 U
Bromomethane	10 U	10 U	10 U	10 U	10 U	10 U
2-Butanone	20 U	20 U	20 U	20 U	20 U	20 U
Carbon Disulfide	5 U	5 U	5 U	5 U	5 U	5 U
Carbon Tetrachloride	5 U	5 U	5 U	5 U	5 U	5 U
Chlorobenzene	5 U	5 U	5 U	5 U	5 U	5 U
Chloroethane	10 U	10 U	10 U	10 U	10 U	10 U
2-Chloroethylvinylether	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	5 U	5 U	5 U	5 U	5 U	5 U
Chloromethane	10 U	10 U	10 U	10 U	10 U	10 U
Dibromochloromethane	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethane	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethane	5 U	5 U	5 U	5 U	5 U	5 U
total-1,2-Dichloroethene	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloropropane	5 U	5 U	5 U	5 U	5 U	5 U
cis-1,3-Dichloropropene	5 U	5 U	5 U	5 U	5 U	5 U
trans-1,3-Dichloropropene	5 U	5 U	5 U	5 U	5 U	5 U
Ethylbenzene	5 U	5 U	5 U	5 U	5 U	5 U
2-Hexanone	10 U	10 U	10 U	10 U	10 U	10 U
Methylene Chloride	5 U	5 U	5 U	5 U	5 U	5 U
4-Methyl-2-Pentanone	10 U	10 U	10 U	10 U	10 U	10 U
Styrene	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	5 U	5 U	5 U	5 U	5 U	5 U
Tetrachloroethene	5 U	5 U	5 U	5 U	5 U	5 U
Toluene	5 U	5 U	5 U	5 U	5 U	5 U
1,1,1-Trichloroethane	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane	5 U	5 U	5 U	5 U	5 U	5 U
Trichloroethene	5 U	5 U	5 U	5 U	5 U	5 U
Trichlorofluoromethane	5 U	5 U	5 U	5 U	5 U	5 U
Vinyl Acetate	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl Chloride	10 U	10 U	10 U	10 U	10 U	10 U
Xylenes (total)	5 U	5 U	5 U	5 U	5 U	5 U

Volatile Soil Analytical Results for Site No. 26 **Duluth Air National Guard Base, Duluth, Minnesota**

(Results in micrograms per kilogram unless otherwise noted)

Location No.:	026-003BH 1.5-2.5 Dup	026-003BH 6.5-7	026-004BH 2-2.5	026-004BH 9.5-10	026-005BH 1.5-2.5	026-005BH 1.5-2.5 Dup
Sample Date:	05/04/95	05/04/95	05/03/95	05/03/95	05/03/95	05/03/95
Lab Sample No.:	9505209-01	9505209-03	9505164-03	9505164-04	9505164-05	9505164-09
VOCs	Matrix	Soil	Soil	Soil	Soil	Soil
Acetone		100 U	100 U	100 U	100 U	100 U
Benzene		5 U	5 U	5 U	5 U	5 U
Bromodichloromethane		5 U	5 U	5 U	5 U	5 U
Bromoform		5 U	5 U	5 U	5 U	5 U
Bromomethane		10 U	10 U	10 U	10 U	10 U
2-Butanone		20 U	20 U	20 U	20 U	20 U
Carbon Disulfide		5 U	5 U	5 U	5 U	5 U
Carbon Tetrachloride		5 U	5 U	5 U	5 U	5 U
Chlorobenzene		5 U	5 U	5 U	5 U	5 U
Chloroethane		10 U	10 U	10 U	10 U	10 U
2-Chloroethylvinylether		10 U	10 U	10 U	10 U	10 U
Chloroform		5 U	5 U	5 U	5 U	5 U
Chloromethane		10 U	10 U	10 U	10 U	10 U
Dibromochloromethane		5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethane		5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene		5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethane		5 U	5 U	5 U	5 U	5 U
total-1,2-Dichloroethene		5 U	5 U	5 U	5 U	5 U
1,2-Dichloropropane		5 U	5 U	5 U	5 U	5 U
cis-1,3-Dichloropropene		5 U	5 U	5 U	5 U	5 U
trans-1,3-Dichloropropene		5 U	5 U	5 U	5 U	5 U
Ethylbenzene		5 U	5 U	5 U	5 U	5 U
2-Hexanone		10 U	10 U	10 U	10 U	10 U
Methylene Chloride		5 U	5 U	5 U	5 U	5 U
4-Methyl-2-Pentanone		10 U	10 U	10 U	10 U	10 U
Styrene		5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane		5 U	5 U	5 U	5 U	5 U
Tetrachloroethene		5 U	5 U	5 U	5 U	5 U
Toluene		5 U	5 U	5 U	5 U	7
1,1,1-Trichloroethane		5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane		5 U	5 U	5 U	5 U	5 U
Trichloroethene		5 U	5 U	5 U	5 U	5 U
Trichlorofluoromethane		5 U	5 U	5 U	5 U	5 U
Vinyl Acetate		10 U	10 U	10 U	10 U	10 U
Vinyl Chloride		10 U	10 U	10 U	10 U	10 U
Xylenes (total)		5 U	5 U	5 U	5 U	5 U

BH - Borehole

VOC - Volatile Organic Compounds

U - Indicates compound was analyzed for but not detected

Appendix K.7

Volatile Soil Analytical Results for Site No. 26

Duluth Air National Guard Base, Duluth, Minnesota

(Results in micrograms per kilogram unless otherwise noted)

Location No.:	026-005BH 9.5-10	026-006BH 2.2.5	026-006BH 11.5-12
Sample Date:	05/03/95	05/03/95	05/03/95
Lab Sample No.:	9505164-06	9505164-08	9505164-07
VOCs	Matrix	Soil	Soil
Acetone	100 U	100 U	100 U
Benzene	5 U	5 U	5 U
Bromodichloromethane	5 U	5 U	5 U
Bromoform	5 U	5 U	5 U
Bromomethane	10 U	10 U	10 U
2-Butanone	20 U	20 U	20 U
Carbon Disulfide	5 U	5 U	5 U
Carbon Tetrachloride	5 U	5 U	5 U
Chlorobenzene	5 U	5 U	5 U
Chloroethane	10 U	10 U	10 U
2-Chloroethylvinylether	10 U	10 U	10 U
Chloroform	5 U	5 U	5 U
Chloromethane	10 U	10 U	10 U
Dibromochloromethane	5 U	5 U	5 U
1,1-Dichloroethane	5 U	5 U	5 U
1,1-Dichloroethene	5 U	5 U	5 U
1,2-Dichloroethane	5 U	5 U	5 U
total-1,2-Dichloroethene	5 U	5 U	5 U
1,2-Dichloropropane	5 U	5 U	5 U
cis-1,3-Dichloropropene	5 U	5 U	5 U
trans-1,3-Dichloropropene	5 U	5 U	5 U
Ethylbenzene	5 U	5 U	5 U
2-Hexanone	10 U	10 U	10 U
Methylene Chloride	5 U	5 U	5 U
4-Methyl-2-Pentanone	10 U	10 U	10 U
Styrene	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	5 U	5 U	5 U
Tetrachloroethene	5 U	5 U	5 U
Toluene	5 U	5 U	5 U
1,1,1-Trichloroethane	5 U	5 U	5 U
1,1,2-Trichloroethane	5 U	5 U	5 U
Trichloroethene	5 U	5 U	5 U
Trichlorofluoromethane	5 U	5 U	5 U
Vinyl Acetate	10 U	10 U	10 U
Vinyl Chloride	10 U	10 U	10 U
Xylenes (total)	5 U	5 U	5 U

Semivolatile Soil Analytical Results for Site No. 26
Duluth Air National Guard Base, Duluth, Minnesota
 (Results in micrograms per kilogram unless otherwise noted)

Location No.:	026-001BH 2-2.5	026-001BH 9.5-10	026-001BH 9.5-10 Dup	026-002BH 2-2.5	026-002BH 6.5-7	026-003BH 1.5-2.5
Sample Date:	05/03/95	05/03/95	05/03/95	05/04/95	05/04/95	05/04/95
Lab Sample No.:	9505164-01	9505164-02	9505164-10	9505209-04	9505209-05	9505209-02
SVOCs	Matrix	Soil	Soil	Soil	Soil	Soil
Acenaphthene	330 U	330 U	330 U	330 U	330 U	330 U
Acenaphthylene	330 U	330 U	330 U	330 U	330 U	330 U
Aniline	330 U	330 U	330 U	330 U	330 U	330 U
Anthracene	330 U	330 U	330 U	330 U	330 U	330 U
Benzo(a)Anthracene	330 U	330 U	330 U	330 U	330 U	330 U
Benzo(b)Fluoranthene	330 U	330 U	330 U	330 U	330 U	330 U
Benzo(k)Fluoranthene	330 U	330 U	330 U	330 U	330 U	330 U
Benzo(a)Pyrene	330 U	330 U	330 U	330 U	330 U	330 U
Benzoic Acid	1600 U	1600 U	1600 U	1600 U	1600 U	1600 U
Benzo(g,h,i)Perylene	330 U	330 U	330 U	330 U	330 U	330 U
Benzyl alcohol	330 U	330 U	330 U	330 U	330 U	330 U
4-Bromophenylphenyl ether	330 U	330 U	330 U	330 U	330 U	330 U
Butylbenzylphthalate	330 U	330 U	330 U	330 U	330 U	330 U
di-n-Butyl phthalate	330 U	330 U	330 U	330 U	330 U	330 U
Carbazole	330 U	330 U	330 U	330 U	330 U	330 U
4-Chloroaniline	330 U	330 U	330 U	330 U	330 U	330 U
bis(2-Chloroethoxy)Methane	330 U	330 U	330 U	330 U	330 U	330 U
bis(2-Chloroethyl)Ether	330 U	330 U	330 U	330 U	330 U	330 U
bis(2-Chloroisopropyl)Ether	330 U	330 U	330 U	330 U	330 U	330 U
4-Chloro-3-Methylphenol	330 U	330 U	330 U	330 U	330 U	330 U
2-Chloronaphthalene	330 U	330 U	330 U	330 U	330 U	330 U
2-Chlorophenol	330 U	330 U	330 U	330 U	330 U	330 U
4-Chlorophenylphenyl ether	330 U	330 U	330 U	330 U	330 U	330 U
Chrysene	330 U	330 U	330 U	330 U	330 U	330 U
Dibenz(a,h)Anthracene	330 U	330 U	330 U	330 U	330 U	330 U
Dibenzofuran	330 U	330 U	330 U	330 U	330 U	330 U
1,2-Dichlorobenzene	330 U	330 U	330 U	330 U	330 U	330 U
1,3-Dichlorobenzene	330 U	330 U	330 U	330 U	330 U	330 U
1,4-Dichlorobenzene	330 U	330 U	330 U	330 U	330 U	330 U
3,3'-Dichlorobenzidine	330 U	330 U	330 U	330 U	330 U	330 U
2,4-Dichlorophenol	330 U	330 U	330 U	330 U	330 U	330 U
Diethylphthalate	330 U	330 U	330 U	330 U	330 U	330 U
2,4-Dimethylphenol	330 U	330 U	330 U	330 U	330 U	330 U
Dimethyl Phthalate	330 U	330 U	330 U	330 U	330 U	330 U

BH - Borehole

SVOC - Semivolatile Organic Compounds

U - Indicates compound was analyzed for but not detected

Appendix K.8
Semivolatile Soil Analytical Results for Site No. 26
Duluth Air National Guard Base, Duluth, Minnesota
 (Results in micrograms per kilogram unless otherwise noted)

Location No.:	026-001BH-2.2.5	026-001BH-9.5-10	026-001BH-9.5-10 Dup	026-002BH-2.2.5	026-002BH-6.5-7	026-003BH-1.5-2.5
Sample Date:	05/03/95	05/03/95	05/03/95	05/04/95	05/04/95	05/04/95
Lab Sample No.:	9505164-01	9505164-02	9505164-10	9505209-04	9505209-05	9505209-02
SVOCs	Matrix	Soil	Soil	Soil	Soil	Soil
4,6-Dinitro-2-Methylphenol	800 U	800 U	800 U	800 U	800 U	800 U
2,4-Dinitrophenol	800 U	800 U	800 U	800 U	800 U	800 U
2,4-Dinitrotoluene	330 U	330 U	330 U	330 U	330 U	330 U
2,6-Dinitrotoluene	330 U	330 U	330 U	330 U	330 U	330 U
1,2-Diphenylhydrazine	330 U	330 U	330 U	330 U	330 U	330 U
bis(2-Ethylhexyl)Phthalate	330 U	330 U	330 U	330 U	330 U	330 U
Fluoranthene	330 U	330 U	330 U	330 U	330 U	330 U
Fluorene	330 U	330 U	330 U	330 U	330 U	330 U
1-Hexachlorobenzene	330 U	330 U	330 U	330 U	330 U	330 U
Hexachlorobutadiene	330 U	330 U	330 U	330 U	330 U	330 U
Hexachloroethane	330 U	330 U	330 U	330 U	330 U	330 U
Hexachlorocyclopentadiene	330 U	330 U	330 U	330 U	330 U	330 U
Indeno(1,2,3-cd)Pyrene	330 U	330 U	330 U	330 U	330 U	330 U
Isophorone	330 U	330 U	330 U	330 U	330 U	330 U
2-Methylnaphthalene	330 U	330 U	330 U	330 U	330 U	330 U
2-Methylphenol	330 U	330 U	330 U	330 U	330 U	330 U
4-Methylphenol	330 U	330 U	330 U	330 U	330 U	330 U
Naphthalene	330 U	330 U	330 U	330 U	330 U	330 U
2-Nitroaniline	800 U	800 U	800 U	800 U	800 U	800 U
3-Nitroaniline	800 U	800 U	800 U	800 U	800 U	800 U
4-Nitroaniline	800 U	800 U	800 U	800 U	800 U	800 U
Nitrobenzene	330 U	330 U	330 U	330 U	330 U	330 U
2-Nitrophenol	330 U	330 U	330 U	330 U	330 U	330 U
4-Nitrophenol	800 U	800 U	800 U	800 U	800 U	800 U
N-Nitrosodiphenylamine (1)	330 U	330 U	330 U	330 U	330 U	330 U
N-Nitroso-Di-n-Propylamine	330 U	330 U	330 U	330 U	330 U	330 U
Di-n-Octyl Phthalate	330 U	330 U	330 U	330 U	330 U	330 U
Pentachlorophenol	800 U	800 U	800 U	800 U	800 U	800 U
Phenanthrene	330 U	330 U	330 U	330 U	330 U	330 U
Phenol	330 U	330 U	330 U	330 U	330 U	330 U
Pyrene	330 U	330 U	330 U	330 U	330 U	330 U
Pyridine	330 U	330 U	330 U	330 U	330 U	330 U
1,2,4-Trichlorobenzene	330 U	330 U	330 U	330 U	330 U	330 U
2,4,5-Trichlorophenol	800 U	800 U	800 U	800 U	800 U	800 U
2,4,6-Trichlorophenol	330 U	330 U	330 U	330 U	330 U	330 U

BH - Borehole

SVOCs - Semivolatile Organic Compounds

U - Indicates compound was analyzed for but not detected

Semivolatile Soil Analytical Results for Site No. 26

Duluth Air National Guard Base, Duluth, Minnesota

(Results in micrograms per kilogram unless otherwise noted)

Location No.:	026-003BH 1.5-2.5 Dup	026-003BH 6.5-7	026-004BH 2.2-5	026-004BH 9.5-10	026-005BH 1.5-2.5	026-005BH 1.5-2.5 Dup
Sample Date:	05/04/95	05/04/95	05/03/95	05/03/95	05/03/95	05/03/95
Lab Sample No.:	9505209-01	9505209-03	9505164-03	9505164-04	9505164-05	9505164-09
SVOCs	Matrix	Soil	Soil	Soil	Soil	Soil
Acenaphthene	660 U	330 U	330 U	330 U	330 U	990 U
Acenaphthylene	660 U	330 U	330 U	330 U	330 U	990 U
Aniline	660 U	330 U	330 U	330 U	330 U	990 U
Anthracene	660 U	330 U	330 U	330 U	330 U	990 U
Benzo(a)Anthracene	660 U	330 U	330 U	330 U	330 U	990 U
Benzo(b)Fluoranthene	660 U	330 U	330 U	330 U	330 U	990 U
Benzo(k)Fluoranthene	660 U	330 U	330 U	330 U	330 U	990 U
Benzo(a)Pyrene	660 U	330 U	330 U	330 U	330 U	990 U
Benzoic Acid	3200U	1600 U	1600 U	1600 U	1600 U	4800 U
Benzo(g,h,i)Perylene	660 U	330 U	330 U	330 U	330 U	990 U
Benzyl alcohol	660 U	330 U	330 U	330 U	330 U	990 U
4-Bromophenylphenyl ether	660 U	330 U	330 U	330 U	330 U	990 U
Butylbenzylphthalate	660 U	330 U	330 U	330 U	330 U	990 U
di-n-Butyl phthalate	660 U	330 U	330 U	330 U	330 U	990 U
Carbazole	660 U	330 U	330 U	330 U	330 U	990 U
4-Chloroaniline	660 U	330 U	330 U	330 U	330 U	990 U
bis(2-Chloroethoxy)Methane	660 U	330 U	330 U	330 U	330 U	990 U
bis(2-Chloroethyl)Ether	660 U	330 U	330 U	330 U	330 U	990 U
bis(2-Chloroisopropyl)Ether	660 U	330 U	330 U	330 U	330 U	990 U
4-Chloro-3-Methylphenol	660 U	330 U	330 U	330 U	330 U	990 U
2-Chloronaphthalene	660 U	330 U	330 U	330 U	330 U	990 U
2-Chlorophenol	660 U	330 U	330 U	330 U	330 U	990 U
4-Chlorophenylphenyl ether	660 U	330 U	330 U	330 U	330 U	990 U
Chrysene	660 U	330 U	330 U	330 U	330 U	990 U
Dibenz(a,h)Anthracene	660 U	330 U	330 U	330 U	330 U	990 U
Dibenzofuran	660 U	330 U	330 U	330 U	330 U	990 U
1,2-Dichlorobenzene	660 U	330 U	330 U	330 U	330 U	990 U
1,3-Dichlorobenzene	660 U	330 U	330 U	330 U	330 U	990 U
1,4-Dichlorobenzene	660 U	330 U	330 U	330 U	330 U	990 U
3,3'-Dichlorobenzidine	660 U	330 U	330 U	330 U	330 U	990 U
2,4-Dichlorophenol	660 U	330 U	330 U	330 U	330 U	990 U
Diethylphthalate	660 U	330 U	330 U	330 U	330 U	990 U
2,4-Dimethylphenol	660 U	330 U	330 U	330 U	330 U	990 U
Dimethyl Phthalate	660 U	330 U	330 U	330 U	330 U	990 U

BH - Borehole

SVOC - Semivolatile Organic Compounds

U - Indicates compound was analyzed for but not detected

Appendix K.8

Semivolatile Soil Analytical Results for Site No. 26
Duluth Air National Guard Base, Duluth, Minnesota

(Results in micrograms per kilogram unless otherwise noted)

Location No.	026-003BH 1.5-2.5 Dup	026-003BH 6.5-7	026-004BH 2-2.5	026-004BH 9.5-10	026-005BH 1.5-2.5	026-005BH 1.5-2.5 Dup
Sample Date:	05/04/95	05/04/95	05/03/95	05/03/95	05/03/95	05/03/95
Lab Sample No.:	9505209-01	9505209-03	9505164-03	9505164-04	9505164-05	9505164-09
SVOCs	Matrix	Soil	Soil	Soil	Soil	Soil
4,6-Dinitro-2-Methylphenol	1600 U	800 U	800 U	800 U	800 U	2400 U
2,4-Dinitrophenol	1600 U	800 U	800 U	800 U	800 U	2400 U
2,4-Dinitrotoluene	660 U	330 U	330 U	330 U	330 U	990 U
2,6-Dinitrotoluene	660 U	330 U	330 U	330 U	330 U	990 U
1,2-Diphenylhydrazine	660 U	330 U	330 U	330 U	330 U	990 U
bis(2-Ethylhexyl)Phthalate	660 U	330 U	330 U	330 U	330 U	990 U
Fluoranthene	660 U	330 U	330 U	330 U	330 U	990 U
Fluorene	660 U	330 U	330 U	330 U	330 U	990 U
Hexachlorobenzene	660 U	330 U	330 U	330 U	330 U	990 U
Hexachlorobutadiene	660 U	330 U	330 U	330 U	330 U	990 U
Hexachloroethane	660 U	330 U	330 U	330 U	330 U	990 U
Hexachlorocyclopentadiene	660 U	330 U	330 U	330 U	330 U	990 U
Indeno(1,2,3-cd)Pyrene	660 U	330 U	330 U	330 U	330 U	990 U
Isophorone	660 U	330 U	330 U	330 U	330 U	990 U
2-Methylnaphthalene	660 U	330 U	330 U	330 U	330 U	990 U
2-Methylphenol	660 U	330 U	330 U	330 U	330 U	990 U
4-Methylphenol	660 U	330 U	330 U	330 U	330 U	990 U
Naphthalene	660 U	330 U	330 U	330 U	330 U	990 U
2-Nitroaniline	1600 U	800 U	800 U	800 U	800 U	2400 U
3-Nitroaniline	1600 U	800 U	800 U	800 U	800 U	2400 U
4-Nitroaniline	1600 U	800 U	800 U	800 U	800 U	2400 U
Nitrobenzene	660 U	330 U	330 U	330 U	330 U	990 U
2-Nitrophenol	660 U	330 U	330 U	330 U	330 U	990 U
4-Nitrophenol	1600 U	800 U	800 U	800 U	800 U	2400 U
N-Nitrosodiphenylamine (1)	660 U	330 U	330 U	330 U	330 U	990 U
N-Nitroso-Di-n-Propylamine	660 U	330 U	330 U	330 U	330 U	990 U
Di-n-Octyl Phthalate	660 U	330 U	330 U	330 U	330 U	990 U
Pentachlorophenol	1600 U	800 U	800 U	800 U	800 U	2400 U
Phenanthrene	660 U	330 U	330 U	330 U	330 U	990 U
Phenol	660 U	330 U	330 U	330 U	330 U	990 U
Pyrene	660 U	330 U	330 U	330 U	330 U	990 U
Pyridine	660 U	330 U	330 U	330 U	330 U	990 U
1,2,4-Trichlorobenzene	660 U	330 U	330 U	330 U	330 U	990 U
2,4,5-Trichlorophenol	1600 U	800 U	800 U	800 U	800 U	2400 U
2,4,6-Trichlorophenol	660 U	330 U	330 U	330 U	330 U	990 U

Semivolatle Soil Analytical Results for Site No.26

Duluth Air National Guard Base, Duluth, Minnesota

(Results in micrograms per kilogram unless otherwise noted)

Location No.:	026-005BH-9.5-10	026-006BH-2-2.5	026-006BH-11.5-12
Sample Date:	05/03/95	05/03/95	05/03/95
Lab Sample No.:	9505164-06	9505164-08	9505164-07
SVOCs	Matrix	Soil	Soil
Acenaphthene	330 U	660 U	330 U
Acenaphthylene	330 U	660 U	330 U
Aniline	330 U	660 U	330 U
Anthracene	330 U	660 U	330 U
Benzo(a)Anthracene	330 U	660 U	330 U
Benzo(b)Fluoranthene	330 U	660 U	330 U
Benzo(k)Fluoranthene	330 U	660 U	330 U
Benzo(a)Pyrene	330 U	660 U	330 U
Benzoic Acid	1600 U	3200 U	1600 U
Benzo(g,h,i)Perylene	330 U	660 U	330 U
Benzyl alcohol	330 U	660 U	330 U
4-Bromophenylphenyl ether	330 U	660 U	330 U
Butylbenzylphthalate	330 U	660 U	330 U
di-n-Butyl phthalate	330 U	660 U	330 U
Carbazole	330 U	660 U	330 U
4-Chloroaniline	330 U	660 U	330 U
bis(2-Chloroethoxy)Methane	330 U	660 U	330 U
bis(2-Chloroethyl)Ether	330 U	660 U	330 U
bis(2-Chloroisopropyl)Ether	330 U	660 U	330 U
4-Chloro-3-Methylphenol	330 U	660 U	330 U
2-Chloronaphthalene	330 U	660 U	330 U
2-Chlorophenol	330 U	660 U	330 U
4-Chlorophenylphenyl ether	330 U	660 U	330 U
Chrysene	330 U	660 U	330 U
Dibenz(a,h)Anthracene	330 U	660 U	330 U
Dibenzofuran	330 U	660 U	330 U
1,2-Dichlorobenzene	330 U	660 U	330 U
1,3-Dichlorobenzene	330 U	660 U	330 U
1,4-Dichlorobenzene	330 U	660 U	330 U
3,3'-Dichlorobenzidine	330 U	660 U	330 U
2,4-Dichlorophenol	330 U	660 U	330 U
Diethylphthalate	330 U	660 U	330 U
2,4-Dimethylphenol	330 U	660 U	330 U
Dimethyl Phthalate	330 U	660 U	330 U

BH - Borehole

SVOC - Semivolatle Organic Compounds

U - Indicates compound was analyzed for but not detected

Duluth Air National Guard Base, Duluth, Minnesota

Location No.:	026-005BH 9.5-10	026-006BH 2-2.5	026-006BH 11.5-12
Sample Date:	05/03/95	05/03/95	05/03/95
Lab Sample No.:	9505164-06	9505164-08	9505164-07
SVOCs	Matrix	Soil	Soil
4,6-Dinitro-2-Methylphenol		800 U	1600 U
2,4-Dinitrophenol		800 U	1600 U
2,4-Dinitrotoluene		330 U	660 U
2,6-Dinitrotoluene		330 U	660 U
1,2-Diphenylhydrazine		330 U	660 U
bis(2-Ethylhexyl)Phthalate		330 U	660 U
Fluoranthene		330 U	870
Fluorene		330 U	660 U
Hexachlorobenzene		330 U	660 U
Hexachlorobutadiene		330 U	660 U
Hexachloroethane		330 U	660 U
Hexachlorocyclopentadiene		330 U	660 U
Indeno(1,2,3-cd)Pyrene		330 U	660 U
Isophorone		330 U	660 U
2-Methylnaphthalene		330 U	660 U
2-Methylphenol		330 U	660 U
4-Methylphenol		330 U	660 U
Naphthalene		330 U	660 U
2-Nitroaniline		800 U	1600 U
3-Nitroaniline		800 U	1600 U
4-Nitroaniline		800 U	1600 U
Nitrobenzene		330 U	660 U
2-Nitrophenol		330 U	660 U
4-Nitrophenol		800 U	1600 U
N-Nitrosodiphenylamine (1)		330 U	660 U
N-Nitroso-Di-n-Propylamine		330 U	660 U
Di-n-Octyl Phthalate		330 U	660 U
Pentachlorophenol		800 U	1600 U
Phenanthrene		330 U	800
Phenol		330 U	660 U
Pyrene		330 U	710
Pyridine		330 U	660 U
1,2,4-Trichlorobenzene		330 U	660 U
2,4,5-Trichlorophenol		800 U	1600 U
2,4,6-Trichlorophenol		330 U	660 U

Appendix K.9
Metals Soil Analytical Results for Site No. 26
Duluth Air National Guard Base, Duluth, Minnesota
 (Results in milligrams per kilogram unless otherwise noted)

Location No.:	026-001BH 2-2.5	026-001BH 9.5-10	026-002BH 2-2.5	026-002BH 6.5-7
Sample Date:	05/03/95	05/03/95	05/04/95	05/04/95
Lab Sample No.:	9505164-01	9505164-02	9505209-04	9505209-05
Metals	Matrix	Soil	Soil	Soil
Cadmium, Total	8 U	8 U	8 U	8 U
Chromium, Total	13	10	3.1	3.8
Lead, Total	2.8	2.4	3.2	1.5

Location No.:	026-003BH 1.5-2.5	026-003BH 1.5-2.5 Dup	026-004BH 2-2.5	026-004BH 9.5-10
Sample Date:	05/04/95	05/04/95	05/03/95	05/03/95
Lab Sample No.:	9505209-02	9505209-01	9505164-03	9505164-04
Metals	Matrix	Soil	Soil	Soil
Cadmium, Total	8 U	8 U	8 U	8 U
Chromium, Total	18	6	9	7
Lead, Total	5.9	3.2	5.3	2.5

Location No.:	026-005BH 1.5-2.5	026-005BH 1.5-2.5 Dup	026-006BH 2-2.5	026-006BH 11.5-12
Sample Date:	05/03/95	05/03/95	05/03/95	05/03/95
Lab Sample No.:	9505164-05	9505164-09	9505164-08	9505164-07
Metals	Matrix	Soil	Soil	Soil
Cadmium, Total	8 U	8 U	8 U	8 U
Chromium, Total	7	8	5	4
Lead, Total	4.6	4.2	2.4	2.6

Appendix K.10

Volatile Groundwater Analytical Results For Site No. 26 Duluth Air National Guard Base, Duluth, Minnesota

(Results in micrograms per liter unless otherwise noted)

Location No.:	026-001MW-GW1	026-002MW-GW1	026-003MW-GW1	026-003MW-GW1 Dup
Sample Date:	05/18/95	05/18/95	05/18/95	05/18/95
Lab Sample No.:	9505714-03	9505714-01	9505714-04	9505714-02
VOCs (8260)	Matrix	Water	Water	Water
Benzene		1U	1U	1U
Bromobenzene		1U	1U	1U
Bromochloromethane		1U	1U	1U
Bromodichloromethane		1U	1U	1U
Bromoform		1U	1U	1U
Bromomethane		2U	2U	2U
n-Butylbenzene		1U	1U	1U
sec-Butylbenzene		1U	1U	1U
tert-Butylbenzene		1U	1U	1U
Carbon tetrachloride		1U	1U	1U
Chlorobenzene		1U	1U	1U
Chlorodibromomethane		1U	1U	1U
Chloroethane		4U	4U	4U
Chloroform		1U	1U	1U
Chloromethane		1U	1U	1U
2-Chlorotoluene		1U	1U	1U
4-Chlorotoluene		1U	1U	1U
1,2-Dibromo-3-chloropropane		1U	1U	1U
1,2-Dibromoethane		1U	1U	1U
Dibromomethane		1U	1U	1U
1,2-Dichlorobenzene		1U	1U	1U
1,3-Dichlorobenzene		1U	1U	1U
1,4-Dichlorobenzene		1U	1U	1U
Dichlorodifluoromethane		1U	1U	1U
1,1-Dichloroethane		1U	1U	1U
1,2-Dichloroethane		1U	1U	1U
1,1-Dichloroethene		1U	1U	1U
1,2-Dichloropropane		1U	1U	1U
1,3-Dichloropropane		1U	1U	1U
2,2-Dichloropropane		1U	1U	1U
1,1-Dichloropropene		1U	1U	1U
Ethylbenzene		1U	1U	1U
Hexachlorobutadiene		1U	1U	1U
Isopropylbenzene		1U	1U	1U
p-Isopropyltoluene		1U	1U	1U

MW - Monitoring Well
GW - Groundwater

U - Indicates compound was analyzed for but not detected
026-003MW-GW1
026-003MW-GW1 Dup
026-003MW-GW1
026-003MW-GW1 Dup

Volatile Groundwater Analytical Results For Site No. 26

Duluth Air National Guard Base, Duluth, Minnesota

(Results in micrograms per liter unless otherwise noted)

Location No.:	026-001MW-GW1	026-002MW-GW1	026-003MW-GW1	026-003MW-GW1 Dup
Sample Date:	05/18/95	05/18/95	05/18/95	05/18/95
Lab Sample No.:	9505714-03	9505714-01	9505714-04	9505714-02
VOCs (8260)	Matrix	Water	Water	Water
Methylene chloride	1U	1U	1U	1U
Naphthalene	1U	1U	1U	1U
n-Propylbenzene	1U	1U	1U	1U
Styrene	1U	1U	1U	1U
1,1,1,2-Tetrachloroethane	1U	1U	1U	1U
1,1,2,2-Tetrachloroethane	1U	1U	1U	1U
Tetrachloroethene	1U	1U	1U	1U
Toluene	1U	1U	1U	1U
1,2,3-Trichlorobenzene	1U	1U	1U	1U
1,2,4-Trichlorobenzene	1U	1U	1U	1U
1,1,1-Trichloroethane	1U	1U	1U	1U
1,1,2-Trichloroethane	1U	1U	1U	1U
Trichloroethene	1U	1U	1U	1U
Trichlorofluoromethane	1U	1U	1U	1U
1,2,3-Trichloropropane	1U	1U	1U	1U
1,2,4-Trimethylbenzene	1U	1U	1U	1U
1,3,5-Trimethylbenzene	1U	1U	1U	1U
Vinyl chloride	1U	1U	1U	1U
Xylenes (total)	1U	1U	1U	1U
1,2-Dichloroethene (total)	1U	1U	1U	1U

MW - Monitoring Well
GW - Groundwater

U - Indicates compound was analyzed for but not detected
VOC-8260 - Volatile Organic Compounds-USEPA SW-846/8260

Appendix K.11
Semivolatile Groundwater Analytical Results for Site No. 26
Duluth Air National Guard Base, Duluth, Minnesota
 (Results in micrograms per liter unless otherwise noted)

Location No.:	026-001MW-GW1	026-002MW-GW1	026-003MW-GW1	026-003MW-GW1 Dup
Sample Date:	05/18/95	05/18/95	05/18/95	05/18/95
Lab Sample No.:	9505714-03	9505714-01	9505714-04	9505714-02
SVOCs	Matrix	Water	Water	Water
Acenaphthene	5 U	5 U	5 U	5 U
Acenaphthylene	5 U	5 U	5 U	5 U
Aniline	5 U	5 U	5 U	5 U
Anthracene	5 U	5 U	5 U	5 U
Benzo(a)Anthracene	5 U	5 U	5 U	5 U
Benzo(b)Fluoranthene	5 U	5 U	5 U	5 U
Benzo(k)Fluoranthene	5 U	5 U	5 U	5 U
Benzo(a)Pyrene	5 U	5 U	5 U	5 U
Benzoic Acid	25 U	25 U	25 U	25 U
Benzo(g,h,i)Perylene	5 U	5 U	5 U	5 U
Benzyl alcohol	5 U	5 U	5 U	5 U
4-Bromophenylphenyl ether	5 U	5 U	5 U	5 U
Butylbenzylphthalate	5 U	5 U	5 U	5 U
di-n-Butyl phthalate	5 U	5 U	5 U	5 U
Carbazole	5 U	5 U	5 U	5 U
4-Chloroaniline	5 U	5 U	5 U	5 U
bis(2-Chloroethoxy)Methane	5 U	5 U	5 U	5 U
bis(2-Chloroethyl)Ether	5 U	5 U	5 U	5 U
bis(2-Chloroisopropyl)Ether	5 U	5 U	5 U	5 U
4-Chloro-3-Methylphenol	5 U	5 U	5 U	5 U
2-Chloronaphthalene	5 U	5 U	5 U	5 U
2-Chlorophenol	5 U	5 U	5 U	5 U
4-Chlorophenylphenyl ether	5 U	5 U	5 U	5 U
Chrysene	5 U	5 U	5 U	5 U
Dibenz(a,h)Anthracene	5 U	5 U	5 U	5 U
Dibenzofuran	5 U	5 U	5 U	5 U
1,2-Dichlorobenzene	5 U	5 U	5 U	5 U
1,3-Dichlorobenzene	5 U	5 U	5 U	5 U
1,4-Dichlorobenzene	5 U	5 U	5 U	5 U
3,3'-Dichlorobenzidine	5 U	5 U	5 U	5 U
2,4-Dichlorophenol	5 U	5 U	5 U	5 U
Diethylphthalate	5 U	5 U	5 U	5 U
2,4-Dimethylphenol	5 U	5 U	5 U	5 U
Dimethyl Phthalate	5 U	5 U	5 U	5 U

Semivolatile Groundwater Analytical Results for Site No. 26

Duluth Air National Guard Base, Duluth, Minnesota

(Results in micrograms per liter unless otherwise noted)

Location No.	026-001MW-GW1	026-002MW-GW1	026-003MW-GW1	026-003MW-GW1 Dup
Sample Date:	05/18/95	05/18/95	05/18/95	05/18/95
Lab Sample No.:	9505714-03	9505714-01	9505714-04	9505714-02
SVOCs	Matrix	Water	Water	Water
4,6-Dinitro-2-Methylphenol	25 U	25 U	25 U	25 U
2,4-Dinitrophenol	25 U	25 U	25 U	25 U
2,4-Dinitrotoluene	5 U	5 U	5 U	5 U
2,6-Dinitrotoluene	5 U	5 U	5 U	5 U
1,2-Diphenylhydrazine	5 U	5 U	5 U	5 U
bis(2-Ethylhexyl)Phthalate	5 U	5 U	5 U	5 U
Fluoranthene	5 U	5 U	5 U	5 U
Fluorene	5 U	5 U	5 U	5 U
Hexachlorobenzene	5 U	5 U	5 U	5 U
Hexachlorobutadiene	5 U	5 U	5 U	5 U
Hexachloroethane	5 U	5 U	5 U	5 U
Hexachlorocyclopentadiene	5 U	5 U	5 U	5 U
Indeno(1,2,3-cd)Pyrene	5 U	5 U	5 U	5 U
Isophorone	5 U	5 U	5 U	5 U
2-Methylnaphthalene	5 U	5 U	5 U	5 U
2-Methylphenol	5 U	5 U	5 U	5 U
4-Methylphenol	5 U	5 U	5 U	5 U
Naphthalene	5 U	5 U	5 U	5 U
2-Nitroaniline	25 U	25 U	25 U	25 U
3-Nitroaniline	25 U	25 U	25 U	25 U
4-Nitroaniline	25 U	25 U	25 U	25 U
Nitrobenzene	5 U	5 U	5 U	5 U
2-Nitrophenol	25 U	25 U	25 U	25 U
4-Nitrophenol	25 U	25 U	25 U	25 U
N-Nitrosodiphenylamine (1)	5 U	5 U	5 U	5 U
N-Nitroso-Di-n-Propylamine	5 U	5 U	5 U	5 U
Di-n-Octyl Phthalate	5 U	5 U	5 U	5 U
Pentachlorophenol	25 U	25 U	25 U	25 U
Phenanthrene	5 U	5 U	5 U	5 U
Phenol	51	51	51	51
Pyrene	5 U	5 U	5 U	5 U
Pyridine	5 U	5 U	5 U	5 U
1,2,4-Trichlorobenzene	5 U	5 U	5 U	5 U
2,4,5-Trichlorophenol	10 U	10 U	10 U	10 U
2,4,6-Trichlorophenol	5 U	5 U	5 U	5 U

MW - Monitoring Well
GW - Groundwater

U - Indicates compound was analyzed for but not detected
SVOC - Semivolatile Organic Compounds

APPENDIX L

SUMMARY OF THE QA/QC ANALYTICAL RESULTS

INTRODUCTION

The following is a list of analytical results for QA/QC samples collected at IRP Sites No. 25 and No. 26.

IRP SITES NO. 25 AND NO. 26

SOIL SAMPLES

- L.1 – Volatile QA/QC Summary Results for IRP Sites No. 25 and No. 26
- L.2 – Semivolatile QA/QC Summary Results for IRP Sites No. 25 and No. 26
- L.3 – Metals QA/QC Summary Results for IRP Sites No. 25 and No. 26

GROUNDWATER SAMPLES

- L.4 – Volatile QA/QC Summary Results for IRP Sites No. 25 and No. 26
- L.5 – Semivolatile QA/QC Summary Results for IRP Sites No. 25 and No. 26
- L.6 – Metals QA/QC Summary Results for IRP Sites No. 25 and No. 26

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Volatile QA/QC Summary Results for Sites No.25 and No.26

Duluth Air National Guard Base, Duluth, Minnesota

(Results in micrograms per kilogram unless otherwise noted)

Location No.	025-009BH 14-14.5 MS	025-009BH 14-14.5MSD	026-001BH 9-9.5 MS	026-001BH 9-9.5 MSD
Sample Date:	05/12/95	05/12/95	05/12/95	05/03/95
Lab Sample No.:	9505512-12	9505512-13	9505164-12	9505164-13
VOCs	Matrix	Soil	Soil	Soil
Acetone	100 U	100 U	100 U	100 U
Benzene	46	46	47	49
Bromodichloromethane	42	43	5 U	5 U
Bromoform	37	39	5 U	5 U
Bromomethane	31	31	10 U	10 U
2-Butanone	20 U	20 U	20 U	20 U
Carbon Disulfide	5 U	5 U	5 U	5 U
Carbon Tetrachloride	38	39	5 U	5 U
Chlorobenzene	43	42	41	43
Chloroethane	35	35	10 U	10 U
2-Chloroethylvinylether	47	48	10 U	10 U
Chloroform	48	48	5 U	5 U
Chloromethane	34	34	10 U	10 U
Dibromochloromethane	41	42	5 U	5 U
1,1-Dichloroethane	49	48	5 U	5 U
1,1-Dichloroethene	36	35	44	46
1,2-Dichloroethane	46	47	5 U	5 U
total-1,2-Dichloroethene	84	83	5 U	5 U
1,2-Dichloropropane	48	48	5 U	5 U
cis-1,3-Dichloropropene	38	40	5 U	5 U
trans-1,3-Dichloropropene	42	43	5 U	5 U
Ethylbenzene	44	42	5 U	5 U
2-Hexanone	10 U	10 U	10 U	10 U
Methylene Chloride	40	42	5 U	5 U
4-Methyl-2-Pentanone	10 U	10 U	10 U	10 U
Styrene	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	44	46	5 U	5 U
Tetrachloroethene	40	38	5 U	5 U
Toluene	47	46	43	45
1,1,1-Trichloroethane	46	46	5 U	5 U
1,1,2-Trichloroethane	43	46	5 U	5 U
Trichloroethene	38	43	44	46
Trichlorofluoromethane	5 U	37	5 U	5 U
Vinyl Acetate	10 U	10 U	10 U	10 U
Vinyl Chloride	33	33	10 U	10 U
Xylenes (total)	35	34	5 U	5 U

MS - Matrix Spike

MSD - Matrix Spike Duplicate

VOC - Volatile Organic Compounds

BH - Borehole

U - Indicates compound was analyzed for but not detected

QA/QC - Quality Assurance/Quality Control

Appendix L.2

Semivolatile QA/QC Summary Results for Sites No. 25 and No. 26 Duluth Air National Guard Base, Duluth, Minnesota (Results in micrograms per kilogram unless otherwise noted)

Location No.:	025-008BH 10.5-11MS	025-008BH 10.5-11 MSD	026-001BH 9.9-5 MS	026-001BH 9.9-5 MSD
Sample Date:	05/12/95	05/12/95	05/03/95	05/03/95
Lab Sample No.:	9505512-14	9505512-15	9505164-12	9505164-13
SVOs	Matrix	Soil	Soil	Soil
Acenaphthene	1300	1300	1200	1200
Acenaphthylene	330 U	330 U	330 U	330 U
Aniline	330 U	330 U	330 U	330 U
Anthracene	330 U	330 U	330 U	330 U
Benzo(a)Anthracene	330 U	330 U	330 U	330 U
Benzo(b)Fluoranthene	330 U	330 U	330 U	330 U
Benzo(k)Fluoranthene	330 U	330 U	330 U	330 U
Benzo(a)Pyrene	330 U	330 U	330 U	330 U
Benzoic Acid	1600 U	1600 U	1600 U	1600 U
Benzo(g,h,i)Perylene	330 U	330 U	330 U	330 U
Benzyl alcohol	330 U	330 U	330 U	330 U
4-Bromophenylphenyl ether	330 U	330 U	330 U	330 U
Butylbenzylphthalate	330 U	330 U	330 U	330 U
di-n-Butyl phthalate	330 U	330 U	330 U	330 U
Carbazole	330 U	330 U	330 U	330 U
4-Chloroaniline	330 U	330 U	330 U	330 U
bis(2-Chloroethoxy)Methane	330 U	330 U	330 U	330 U
bis(2-Chloroethyl)Ether	330 U	330 U	330 U	330 U
bis(2-Chloroisopropyl)Ether	330 U	330 U	330 U	330 U
4-Chloro-3-Methylphenol	2000	2000	2100	2200
2-Chloronaphthalene	330 U	330 U	330 U	330 U
2-Chlorophenol	2200	2100	1500	1600
4-Chlorophenylphenyl ether	330 U	330 U	330 U	330 U
Chrysene	330 U	330 U	330 U	330 U
Dibenz(a,h)Anthracene	330 U	330 U	330 U	330 U
Dibenzofuran	330 U	330 U	330 U	330 U
1,2-Dichlorobenzene	330 U	330 U	330 U	330 U
1,3-Dichlorobenzene	330 U	330 U	330 U	330 U
1,4-Dichlorobenzene	1100	1100	1100	1200
3,3'-Dichlorobenzidine	330 U	330 U	330 U	330 U
2,4-Dichlorophenol	330 U	330 U	330 U	330 U
Diethylphthalate	330 U	330 U	330 U	330 U
2,4-Dimethylphenol	330 U	330 U	330 U	330 U
Dimethyl Phthalate	330 U	330 U	330 U	330 U

MS - Matrix Spike

MSD - Matrix Spike Duplicate

BH - Borehole
U - Indicates compound was analyzed for but not detected
QA/QC - Quality Assurance/Quality Control

Semivolatile QA/QC Summary Results for Sites No. 25 and No. 26

Duluth Air National Guard Base, Duluth, Minnesota

(Results in micrograms per kilogram unless otherwise noted)

Location No.:	025-008BH 10.5-11MS	025-008BH 10.5-11MSD	026-001BH 9-9.5 MS	026-001BH 9-9.5 MSD
Sample Date:	05/12/95	05/12/95	05/03/95	05/03/95
Lab Sample No.:	9505512-14	9505512-15	9505164-12	9505164-13
SVOCs	Matrix	Soil	Soil	Soil
4,6-Dinitro-2-Methylphenol	800 U	800 U	800 U	800 U
2,4-Dinitrophenol	800 U	800 U	800 U	800 U
2,4-Dinitrotoluene	1300	1300	1600	1600
2,6-Dinitrotoluene	330 U	330 U	330 U	330 U
1,2-Diphenylhydrazine	330 U	330 U	330 U	330 U
bis(2-Ethylhexyl)Phthalate	330 U	330 U	330 U	330 U
Fluoranthene	330 U	330 U	330 U	330 U
Fluorene	330 U	330 U	330 U	330 U
Hexachlorobenzene	330 U	330 U	330 U	330 U
Hexachlorobutadiene	330 U	330 U	330 U	330 U
Hexachloroethane	330 U	330 U	330 U	330 U
Hexachlorocyclopentadiene	330 U	330 U	330 U	330 U
Indeno(1,2,3-cd)Pyrene	330 U	330 U	330 U	330 U
Isophorone	330 U	330 U	330 U	330 U
2-Methylnaphthalene	330 U	330 U	330 U	330 U
2-Methylphenol	330 U	330 U	330 U	330 U
4-Methylphenol	330 U	330 U	330 U	330 U
Naphthalene	330 U	330 U	330 U	330 U
2-Nitroaniline	800 U	800 U	800 U	800 U
3-Nitroaniline	800 U	800 U	800 U	800 U
4-Nitroaniline	800 U	800 U	800 U	800 U
Nitrobenzene	330 U	330 U	330 U	330 U
2-Nitrophenol	330 U	330 U	330 U	330 U
4-Nitrophenol	1600	1800	3300	3700
N-Nitrosodiphenylamine (1)	330 U	330 U	330 U	330 U
N-Nitroso-Di-n-Propylamine	1300	1300	1500	1700
Di-n-Octyl Phthalate	330 U	330 U	330 U	330 U
Pentachlorophenol	1800	1700	2400	2400
Phenanthrene	330 U	330 U	330 U	330 U
Phenol	2000	2000	1200	1200
Pyrene	1300	1300	1100	1000
Pyridine	330 U	330 U	330 U	330 U
1,2,4-Trichlorobenzene	1300	1300	1200	1400
2,4,5-Trichlorophenol	800 U	800 U	800 U	800 U
2,4,6-Trichlorophenol	330 U	330 U	330 U	330 U

MS - Matrix Spike

MSD - Matrix Spike Duplicate

SVOC - Semivolatile Organic Compounds

BH - Borehole

U - Indicates compound was analyzed for but not detected

QA/QC - Quality Assurance/ Quality Control

Appendix L.3

Metals QA/QC Summary Results for Sites No. 25 and No. 26 Duluth Air National Guard Base, Duluth, Minnesota

(Results in milligrams per kilogram unless otherwise noted)

Location No.:	025-009BH 14-14.5 MS	025-009BH 14-14.5 MSD	026-001BH 9-9.5 MS	026-001BH 9-9.5 MSD
Sample Date:	05/12/95	05/12/95	05/03/95	05/03/95
Lab Sample No.:	9505512-12	9505512-13	9505164-12	9505164-13
Metals	Matrix	Soil	Soil	Soil
Mercury, Total	1.1	1.0	N/A	N/A
Cadmium, Total	89.5	88.7	102	101
Chromium, Total	118	114	11	12
Nickel, Total	114	112	N/A	N/A
Lead, Total	7.8	7.8	6.5	6.5

MS - Matrix Spike
MSD - Matrix Spike Duplicate
BH - Borehole

U - Indicates compound was analyzed for but not detected
QA/QC - Quality Assurance/Quality Control
N/A - Not Analyzed

Volatile QA/QC Summary Results for Sites No.25 and No.26

Duluth Air National Guard Base, Duluth, Minnesota

(Results in micrograms per liter unless otherwise noted)

Location No.:	SI-001-FB	SI-002-FB	SI-001-TB	026-003-RB
Sample Date:	05/18/95	05/19/95	05/08/95	05/18/95
Lab Sample No.:	9505714-05	9505767-02	9505714-06	9505714-07
VOCs (8260)	Matrix	Water	Water	Water
Benzene	1U	5U	1U	1U
Bromobenzene	1U	5U	1U	1U
Bromochloromethane	1U	5U	1U	1U
Bromodichloromethane	1U	5U	1U	1U
Bromoform	1U	5U	1U	1U
Bromomethane	2U	10U	2U	2U
n-Butylbenzene	1U	5U	1U	1U
sec-Butylbenzene	1U	5U	1U	1U
tert-Butylbenzene	1U	5U	1U	1U
Carbon tetrachloride	1U	5U	1U	1U
Chlorobenzene	1U	5U	1U	1U
Chlorodibromomethane	1U	5U	1U	1U
Chloroethane	4U	10U	4U	4U
Chloroform	5	6	1U	4
Chloromethane	1U	10U	1U	1U
2-Chlorotoluene	1U	5U	1U	1U
4-Chlorotoluene	1U	5U	1U	1U
1,2-Dibromo-3-chloropropane	1U	5U	1U	1U
1,2-Dibromoethane	1U	5U	1U	1U
Dibromomethane	1U	5U	1U	1U
1,2-Dichlorobenzene	1U	5U	1U	1U
1,3-Dichlorobenzene	1U	5U	1U	1U
1,4-Dichlorobenzene	1U	5U	1U	1U
Dichlorodifluoromethane	1U	10U	1U	1U
1,1-Dichloroethane	1U	5U	1U	1U
1,2-Dichloroethane	1U	5U	1U	1U
1,1-Dichloroethene	1U	5U	1U	1U
1,2-Dichloropropane	1U	5U	1U	1U
1,3-Dichloropropane	1U	5U	1U	1U
2,2-Dichloropropane	1U	5U	1U	1U
1,1-Dichloropropene	1U	5U	1U	1U
Ethylbenzene	1U	5U	1U	1U
Hexachlorobutadiene	1U	5U	1U	1U
Isopropylbenzene	1U	5U	1U	1U
p-Isopropyltoluene	1U	5U	1U	1U

U - Indicates compound was analyzed for but not detected
VOC 8260 - Volatile Organic Compounds-Meth. 8260
QA/QC - Quality Assurance/Quality Control

FB - Field Blank
SI - Site Investigation
TB - Trip Blank

Appendix L.4

Volatile QA/QC Summary Results for Sites No.25 and No.26 Duluth Air National Guard Base, Duluth, Minnesota

(Results in micrograms per liter unless otherwise noted)

Location No.:	SI-001-FB	SI-002FB	SI-001-TB	026-003-RB
Sample Date:	05/18/95	05/19/95	05/08/95	05/18/95
Lab Sample No.:	9505714-05	9505767-02	9505714-06	9505714-07
VOCs (8260)	Matrix	Water	Water	Water
Methylene chloride	4	5 U	1 U	3
Naphthalene	1 U	5 U	1 U	1 U
n-Propylbenzene	1 U	5 U	1 U	1 U
Styrene	1 U	5 U	1 U	1 U
1,1,1,2-Tetrachloroethane	1 U	5 U	1 U	1 U
1,1,2,2-Tetrachloroethane	1 U	5 U	1 U	1 U
Tetrachloroethene	1 U	5 U	1 U	1 U
Toluene	1 U	5 U	1 U	1 U
1,2,3-Trichlorobenzene	1 U	5 U	1 U	1 U
1,2,4-Trichlorobenzene	1 U	5 U	1 U	1 U
1,1,1-Trichloroethane	1 U	5 U	1 U	1 U
1,1,2-Trichloroethane	1 U	5 U	1 U	1 U
Trichloroethene	1 U	5 U	1 U	1 U
Trichlorofluoromethane	1 U	5 U	1 U	1 U
1,2,3-Trichloropropane	1 U	5 U	1 U	1 U
1,2,4-Trimethylbenzene	1 U	5 U	1 U	1 U
1,3,5-Trimethylbenzene	1 U	5 U	1 U	1 U
Vinyl chloride	1 U	10 U	1 U	1 U
Xylenes (total)	1 U	5 U	1 U	1 U
1,2-Dichloroethene (total)	1 U	5 U	1 U	1 U

U - Indicates compound was analyzed for but not detected
VOC 8260 - Volatile Organic Compounds-Meth. 8260
QA/QC - Quality Assurance/Quality Control

Volatile QA/QC Summary Results for Sites No.25 and No.26

Duluth Air National Guard Base, Duluth, Minnesota

(Results in micrograms per liter unless otherwise noted)

Location No.:	025-001-RB	025-002-RB	026-002-RB	025-001-TB	025-003-TB	Trip Blank	Equipment Blank
Sample Date:	05/11/95	05/16/95	05/04/95	05/15/95	05/16/95	04/26/95	05/03/95
Lab Sample No.:	9505512-01	9505612-02	9505209-06	9505556-01	9505612-01	9505209-07	9505164-11
VOCs	Matrix	Water	Water	Water	Water	Water	Water
Acetone	100 U	100 U	100 U	100 U	100 U	100 U	100 U
Benzene	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Bromodichloromethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Bromoform	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Bromomethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Butanone	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Carbon Disulfide	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Carbon Tetrachloride	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chlorobenzene	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Chloroethylvinylether	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	5 U	5	5	5 U	5 U	5 U	5
Chloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibromochloromethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U
total-1,2-Dichloroethene	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloropropane	5 U	5 U	5 U	5 U	5 U	5 U	5 U
cis-1,3-Dichloropropene	5 U	5 U	5 U	5 U	5 U	5 U	5 U
trans-1,3-Dichloropropene	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Ethylbenzene	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-Hexanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylene Chloride	5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-Methyl-2-Pentanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Styrene	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Tetrachloroethene	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Toluene	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,1-Trichloroethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Trichloroethene	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Trichlorofluoromethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Vinyl Acetate	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl Chloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Xylenes (total)	5 U	5 U	5 U	5 U	5 U	5 U	5 U

RB - Rinsate Blank
FB - Field Blank
TB - Trip Blank

QA/QC - Quality Assurance/Quality Control
U - Indicates compound was analyzed for but not detected
VOC - Volatile Organic Compounds

Appendix L.4
Aromatic Volatile QA\QC Summary Results for Site No. 25
Duluth Air National Guard Base, Duluth, Minnesota
 (Results in micrograms per liter unless otherwise noted)

Location No.:	025-003-RB	025-TB
Sample Date:	05/19/95	05/19/95
Lab Sample No.:	9505767-01	9505767-04
BTEX(8020)	Matrix	Water
Benzene	1 U	1 U
Toluene	1 U	1 U
Ethylbenzene	1 U	1 U
Xylenes (total)	1 U	1 U

RB - Rinsate Blank
 TB - Trip Blank

QA\QC - Quality Assurance\Quality Control

U - Indicates compound was analyzed for but not detected
 BTEX 8020 - Volatile Organic Compounds Method 8020

Appendix L.4

Halogenated Volatile QA\QC Summary Results for Site No.25 Duluth Air National Guard Base, Duluth, Minnesota (Results in micrograms per liter unless otherwise noted)

Location No.:	025-003-RB	025-TB
Sample Date:	05/19/95	05/19/95
Lab Sample No.:	9505767-01	9505767-04
VOC's (8010)	Matrix	Water
Dichlorodifluoromethane	1U	1U
Chloromethane	1U	1U
Vinyl chloride	1U	1U
Bromomethane	1U	1U
Chloroethane	1U	1U
Trichlorofluoromethane	1U	1U
1,1-Dichloroethene	1U	1U
Methylene chloride	4	B 3
Trans-1,2-Dichloroethene	1U	1U
1,1-Dichloroethane	1U	1U
chloroform	5	1U
1,1,1-Trichloroethane	1U	1U
carbon tetrachloride	1U	1U
1,2-Dichloroethane	1U	1U
2-Chloroethylvinyl ether	1U	1U
Trichloroethene	1U	1U
1,2-Dichloropropane	1U	1U
Bromodichloromethane	1U	1U
cis-1,3-Dichloropropene	1U	1U
trans-1,3-Dichloropropene	1U	1U
1,1,2-Trichloroethane	1U	1U
Tetrachloroethene	1U	1U
Dibromochloromethane	1U	1U
Chlorobenzene	1U	1U
Bromoform	1U	1U
1,1,2,2-Tetrachloroethane	1U	1U
1,3-Dichlorobenzene	1U	1U
1,4-Dichlorobenzene	1U	1U
1,2-Dichlorobenzene	1U	1U

B - Indicates compound was detected in the Method Blank
RB - Rinseate Blank
TB - Trip Blank

U - Indicates compound was analyzed for but not detected
PAH 8010-Polynuclear Aromatic Hydrocarbon Compounds

Appendix L.5
Semivolatile QA/QC Summary Results for Sites No. 25 and No. 26
Duluth Air National Guard Base, Duluth, Minnesota
 (Results in micrograms per liter unless otherwise noted)

Location No.:	025-001-RB	025-002-RB	025-003-RB	026-002-RB	026-003-RB	Equipment Blank	SI-001-FB
Sample Date:	05/11/95	05/16/95	05/19/95	05/04/95	05/18/95	05/03/95	05/18/95
Lab Sample No.:	9505512-01	9505612-02	9505767-01	9505209-06	9505714-07	9505164-11	9505714-05
SVOCs	Matrix	Water	Water	Water	Water	Water	Water
Acenaphthene	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Acenaphthylene	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Aniline	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Anthracene	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Benzo(a)Anthracene	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Benzo(b)Fluoranthene	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Benzo(k)Fluoranthene	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Benzo(a)Pyrene	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Benzoic Acid	25 U	25 U	25 U	25 U	25 U	25 U	25 U
Benzo(g,h,i)Perylene	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Benzyl alcohol	5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-Bromophenylphenyl ether	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Butylbenzylphthalate	5 U	5 U	5 U	5 U	5 U	5 U	5 U
di-n-Butyl phthalate	5 U	5	5 U	5 U	5 U	5 U	5
Carbazole	5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-Chloroaniline	5 U	5 U	5 U	5 U	5 U	5 U	5 U
bis(2-Chloroethoxy)Methane	5 U	5 U	5 U	5 U	5 U	5 U	5 U
bis(2-Chloroethyl)Ether	5 U	5 U	5 U	5 U	5 U	5 U	5 U
bis(2-Chloroisopropyl)Ether	5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-Chloro-3-Methylphenol	5 U	5 U	5 U	8	5 U	5 U	5 U
2-Chloronaphthalene	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-Chlorophenol	5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-Chlorophenylphenyl ether	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chrysene	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Dibenz(a,h)Anthracene	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Dibenzofuran	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichlorobenzene	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,3-Dichlorobenzene	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,4-Dichlorobenzene	5 U	5 U	5 U	5 U	5 U	5 U	5 U
3,3'-Dichlorobenzidine	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2,4-Dichlorophenol	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Diethylphthalate	5 U	5 U	5 U	5 U	5 U	5 U	5 U
4,6-Dinitro-2-Methylphenol	25 U	25 U	25 U	25 U	25 U	25 U	25 U
2,4-Dinitrophenol	25 U	25 U	25 U	25 U	25 U	25 U	25 U

RB - Rinsate Blank
 FB - Field Blank
 QA/QC - Quality Assurance/ Quality Control

U - Indicates compound was analyzed for but not detected
 SVOC - Semivolatile Organic Compounds
 SI - Site Investigation

Semivolatile QA/QC Summary Results for Sites No. 25 and No. 26

Duluth Air National Guard Base, Duluth, Minnesota

(Results in micrograms per liter unless otherwise noted)

Location No.	025-001:RB	025-002:RB	025-003:RB	026-002:RB	026-003:RB	Equipment Blank	SE-001:FB
Sample Date:	05/11/95	05/16/95	05/19/95	05/04/95	05/18/95	05/03/95	05/18/95
Lab Sample No.:	9505512-01	9505612-02	9505767-01	9505209-06	9505714-07	9505164-11	9505714-05
SVOCs	Matrix	Water	Water	Water	Water	Water	Water
2,4-Dinitrotoluene	5U	5U	5U	5U	5U	5U	5U
2,6-Dinitrotoluene	5U	5U	5U	5U	5U	5U	5U
2,4-Dinitrotoluene	5U	5U	5U	5U	5U	5U	5U
2,6-Dinitrotoluene	5U	5U	5U	5U	5U	5U	5U
1,2-Diphenylhydrazine	5U	5U	5U	5U	5U	5U	5U
bis(2-Ethylhexyl)Phthalate	5U	5U	5U	5U	5U	5U	5U
Fluoranthene	5U	5U	5U	5U	5U	5U	5U
Fluorene	5U	5U	5U	5U	5U	5U	5U
Hexachlorobenzene	5U	5U	5U	5U	5U	5U	5U
Hexachlorobutadiene	5U	5U	5U	5U	5U	5U	5U
Hexachloroethane	5U	5U	5U	5U	5U	5U	5U
Hexachlorocyclopentadiene	5U	5U	5U	5U	5U	5U	5U
Indeno(1,2,3-cd)Pyrene	5U	5U	5U	5U	5U	5U	5U
Isophorone	5U	5U	5U	5U	5U	5U	5U
2-Methylnaphthalene	5U	5U	5U	5U	5U	5U	5U
2-Methylphenol	5U	5U	5U	5U	5U	5U	5U
4-Methylphenol	5U	5U	5U	5U	5U	5U	5U
Naphthalene	5U	5U	5U	5U	5U	5U	5U
2-Nitroaniline	25U	25U	25U	25U	25U	25U	25U
3-Nitroaniline	25U	25U	25U	25U	25U	25U	25U
4-Nitroaniline	25U	25U	25U	25U	25U	25U	25U
Nitrobenzene	5U	5U	5U	5U	5U	5U	5U
2-Nitrophenol	25U	25U	25U	25U	25U	25U	25U
4-Nitrophenol	25U	25U	25U	25U	25U	25U	25U
N-Nitrosodiphenylamine (I)	5U	5U	5U	5U	5U	5U	5U
N-Nitroso-Di-n-Propylamine	5U	5U	5U	5U	5U	5U	5U
Di-n-Octyl Phthalate	5U	5U	5U	5U	5U	5U	5U
Pentachlorophenol	25U	25U	25U	25U	25U	25U	25U
Phenanthrene	5U	5U	5U	5U	5U	5U	5U
Phenol	5U	5U	5U	5U	5U	5U	5U
Pyrene	5U	5U	5U	5U	5U	5U	5U
Pyridine	5U	5U	5U	5U	5U	5U	5U
1,2,4-Trichlorobenzene	5U	5U	5U	5U	5U	5U	5U
2,4,5-Trichlorophenol	10U	10U	10U	10U	10U	10U	10U
2,4,6-Trichlorophenol	5U	5U	5U	5U	5U	5U	5U

RB - Rinsate Blank

FB - Field Blank

QA/QC - Quality Assurance/ Quality Control

U - Indicates compound was analyzed for but not detected
SVOC - Semivolatile Organic Compounds

SI - Site Investigation

Appendix L.6

Metals QA/QC Summary Results for Sites No.25 and No.26

Duluth Air National Guard Base, Duluth, Minnesota

(Results in milligrams per liter unless otherwise noted)

Location No.:	025-001-RB	025-002-RB	025-003-RB	026-002-RB
Sample Date:	05/11/95	05/16/95	05/19/95	05/04/95
Lab Sample No.:	9505512-01	9505612-02	9505767-01	9505209-06
Metals	Matrix	Water	Water	Water
Mercury, Total	0.0004 U	0.0004 U	0.0004 U	N/A
Cadmium, Total	0.004 U	0.004 U	0.005 U	0.004 U
Chromium, Total	0.01 U	0.002 U	0.002 U	0.01 U
Nickel, Total	0.02 U	0.02 U	0.02 U	N/A
Lead, Total	0.006	0.006	0.004 U	0.004 U

Location No.:	Equipment Blank	SI-001-FB	SI-002-FB
Sample Date:	05/03/95	05/18/95	05/19/95
Lab Sample No.:	9505164-11	9505174-05	9505767-02
Metals	Matrix	Water	Water
Mercury, Total	N/A	N/A	0.0004 U
Cadmium, Total	0.004 U	0.005 U	0.005 U
Chromium, Total	0.01 U	0.002 U	0.002 U
Nickel, Total	N/A	0.02 U	0.02 U
Lead, Total	0.004 U	0.004 U	0.004 U

RB - Rinsate Blank
 FB - Field Blank
 N/A - Not Analyzed

QA/QC - Quality Assurance/Quality Control
 U - Indicates compound was analyzed for but not detected



OPERATIONAL TECHNOLOGIES
C O R P O R A T I O N

Minnesota Air National Guard Remedial Investigation/Feasible Study
Duluth, Minnesota 1315-197/1315-213
Southern Petroleum Laboratories Inc.
Houston, Texas
Data Evaluation Review

SAMPLE:

SOIL

026-001BH 2-2.5

Lab ID# H9-9505164-01

Date Sampled: 05/03/95

Date Received: 05/04/95

*Sample Identification needs to be corrected to read from 026-00BH 2-2.5 to 026-001BH 2-2.5.

Volatiles

SW846-8240 =

- *No hits were detected above the assigned detection limits.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

- *No hits were detected above the assigned detection limits.
- *Met 14 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Metals

Lead-SW7421=

- *Hit was detected at 2.8 mg/kg with the detection limit of 0.4 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Chromium-SW7191=

- *No sample results were reported for Chromium-SW7191.
- *Met 6 month holding times.
- *COC information verified.

Cadmium-SW6010=

- *No sample results were reported for Cadmium-SW6010.
- *Met 6 month holding times.
- *COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

SOIL

026-001BH 9.5-10

Lab ID# H9-9505164-02

Date Sampled: 05/03/95

Date Received: 05/04/95

Volatiles

SW846-8240 =

- *No hits were detected above the assigned detection limits.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

- *No hits were detected above the assigned detection limits.
- *Met 14 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits but Percent Difference was greater than 20% on internal standards.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Metals

Lead-SW7421=

- *Hit was detected at 2.4 mg/kg with the detection limit of 0.4 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Chromium-SW7191=

- *Hit was detected at 10 mg/kg with the detection limit of 1 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Cadmium-SW6010=

- *No hit was detected above the assigned detection limit of 8 mg/kg. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 8 mg/kg as opposed to what was requested in the SOW at 0.5 mg/kg. Usability of the data is questionable without a valid explanation of the elevated detection limit.
- *Met 6 month holding times.
- *COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

SOIL

026-004BH 2-2.5

Lab ID# H9-9505164-03

Date Sampled: 05/03/95

Date Received: 05/04/95

Volatiles

SW846-8240 =

- *No hits were detected above the assigned detection limits.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

- *No hits were detected above the assigned detection limits.
- *Met 14 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits but Percent Difference was greater than 20% on internal standards.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Metals

Lead-SW7421=

- *Hit was detected at 5.3 mg/kg with the detection limit of 0.4 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Chromium-SW7191=

- *Hit was detected at 9 mg/kg with the detection limit of 1 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Cadmium-SW6010=

- *No hit was detected above the assigned detection limit of 8 mg/kg. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 8 mg/kg as opposed to what was requested in the SOW at 0.5 mg/kg. Usability of the data is questionable without a valid explanation of the elevated detection limit.
- *Met 6 month holding times.
- *COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

SOIL

026-004BH 9.5-10

Lab ID# H9-9505164-04

Date Sampled: 05/03/95

Date Received: 05/04/95

Volatiles

SW846-8240 =

- *No hits were detected above the assigned detection limits.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

- *No hits were detected above the assigned detection limits.
- *Met 14 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits but Percent Difference was greater than 20% on internal standards.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Metals

Lead-SW7421=

- *Hit was detected at 2.5 mg/kg with the detection limit of 0.4 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Chromium-SW7191=

- *Hit was detected at 7 mg/kg with the detection limit of 2 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Cadmium-SW6010=

- *No hit was detected above the assigned detection limit of 8 mg/kg. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 8 mg/kg as opposed to what was requested in the SOW at 0.5 mg/kg. Usability of the data is questionable without a valid explanation of the elevated detection limit.
- *Met 6 month holding times.
- *COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

SOIL

026-005BH 1.5-2.5

Lab ID# H9-9505164-05

Date Sampled: 05/03/95

Date Received: 05/04/95

Volatiles

SW846-8240 =

- *No hits were detected above the assigned detection limits.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

- *No hits were detected above the assigned detection limits.
- *Met 14 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits but Percent Difference was greater than 20% on internal standards.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Metals

Lead-SW7421=

- *Hit was detected at 4.6 mg/kg with the detection limit of 0.4 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Chromium-SW7191=

- *Hit was detected at 7 mg/kg with the detection limit of 1 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Cadmium-SW6010=

- *No hit was detected above the assigned detection limit of 8 mg/kg. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 8 mg/kg as opposed to what was requested in the SOW at 0.5 mg/kg. Usability of the data is questionable without a valid explanation of the elevated detection limit.
- *Met 6 month holding times.
- *COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

SOIL

026-005BH 9.5-10

Lab ID# H9-9505164-06

Date Sampled: 05/03/95

Date Received: 05/04/95

Volatiles

SW846-8240 =

- *No hits were detected above the assigned detection limits.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

- *No hits were detected above the assigned detection limits.
- *Met 14 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits but Percent Difference was greater than 20% on internal standards.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Metals

Lead-SW7421=

- *Hit was detected at 2.4 mg/kg with the detection limit of 0.4 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Chromium-SW7191=

- *Hit was detected at 3 mg/kg with the detection limit of 1 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Cadmium-SW6010=

- *No hit was detected above the assigned detection limit of 8 mg/kg. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 8 mg/kg as opposed to what was requested in the SOW at 0.5 mg/kg. Usability of the data is questionable without a valid explanation of the elevated detection limit.
- *Met 6 month holding times.
- *COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

SOIL

026-006BH 11.5-12

Lab ID# H9-9505164-07

Date Sampled: 05/03/95

Date Received: 05/04/95

Volatiles

SW846-8240 =

- *No hits were detected above the assigned detection limits.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

- *No hits were detected above the assigned detection limits.
- *Met 14 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits but Percent Difference was greater than 20% on internal standards.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Metals

Lead-SW7421=

- *Hit was detected at 2.6 mg/kg with the detection limit of 0.4 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Chromium-SW7191=

- *Hit was detected at 4 mg/kg with the detection limit of 1 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Cadmium-SW6010=

- *No hit was detected above the assigned detection limit of 8 mg/kg. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 8 mg/kg as opposed to what was requested in the SOW at 0.5 mg/kg. Usability of the data is questionable without a valid explanation of the elevated detection limit.
- *Met 6 month holding times.
- *COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

SOIL

026-006BH 2-2.5

Lab ID# H9-9505164-08

Date Sampled: 05/03/95

Date Received: 05/04/95

Volatiles

SW846-8240 =

- *No hits were detected above the assigned detection limits.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

- *Hits was detected on Fluoranthene at 870 ug/kg, Phenanthrene at 800 ug/kg, and Pyrene at 710 ug/kg with detection limits of 660 ug/kg.
- *Met 14 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits but Percent Difference was greater than 20% on internal standards.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Metals

Lead-SW7421=

- *Hit was detected at 2.4 mg/kg with the detection limit of 0.4 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Chromium-SW7191=

- *Hit was detected at 5 mg/kg with the detection limit of 1 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Cadmium-SW6010=

- *No hit was detected above the assigned detection limit of 8 mg/kg. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 8 mg/kg as opposed to what was requested in the SOW at 0.5 mg/kg. Usability of the data is questionable without a valid explanation of the elevated detection limit.
- *Met 6 month holding times.
- *COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

SOIL

026-005BH .5-1.5

Lab ID# H9-9505164-09

Date Sampled: 05/03/95

Date Received: 05/04/95

Volatiles

SW846-8240 =

- *Hit was detected on Toluene at 7 ug/kg with the detection limit of 5 ug/kg.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

- *No hits were detected above the assigned detection limits. Whv was a 3x dilution was performed?
- *Met 14 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits but Percent Difference was greater than 20% on internal standards.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Metals

Lead-SW7421=

- *Hit was detected at 4.2 mg/kg with the detection limit of 0.4 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Chromium-SW7191=

- *Hit was detected at 8 mg/kg with the detection limit of 1 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Cadmium-SW6010=

- *No hit was detected above the assigned detection limit of 8 mg/kg. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 8 mg/kg as opposed to what was requested in the SOW at 0.5 mg/kg. Usability of the data is questionable without a valid explanation of the elevated detection limit.
- *Met 6 month holding times.
- *COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

SOIL

026-001BH 9-9.5

Lab ID# H9-9505164-10

Date Sampled:

05/03/95

Date Received: 05/04/95

Volatiles

---SW846-8240 =

- *No hits were detected above the assigned detection limits.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

- *No hits were detected above the assigned detection limits.
- *Met 14 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits but Percent Difference was greater than 20% on internal standards.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Metals

Lead-SW7421=

- *Hit was detected at 2.5 mg/kg with the detection limit of 0.4 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Chromium-SW7191=

- *Hit was detected at 6 mg/kg with the detection limit of 1 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Cadmium-SW6010=

- *No hit was detected above the assigned detection limit of 8 mg/kg. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 8 mg/kg as opposed to what was requested in the SOW at 0.5 mg/kg. Usability of the data is questionable without a valid explanation of the elevated detection limit.
- *Met 6 month holding times.
- *COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

WATER

EQUIPMENT BLANK

Lab ID# H9-9505164-11

Date Sampled: 05/03/95

Date Received: 05/04/95

Volatiles

SW846-8240 =

- *Hit was detected on Chloroform at 5 ug/l with the detection limit of 5 ug/l.
- *All met 14-day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

- *No hits were detected above the assigned detection limits.
- *Met 7 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits but Percent Difference was greater than 20% on internal standards.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Metals

Lead-SW7421=

- *No hit was detected above the assigned detection limit of 0.004 mg/l.
- *Met 6 month holding times.
- *COC information verified.

Chromium-SW7191=

- *No hit was detected above the assigned detection limit of 0.01 mg/l.
- *Met 6 month holding times.
- *COC information verified.

Cadmium-SW6010=

- *No hit was detected above the assigned detection limit of 0.004 mg/l. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 0.004 mg/l as opposed to what was requested in the SOW at 0.0006 mg/l. Usability of the data is questionable without a valid explanation of the elevated detection limit.
- *Met 6 month holding times.
- *COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

SOIL

026-001BH 9-9.5 MS

Lab ID# H9-9505164-12

Date Sampled: 05/03/95

Date Received: 05/04/95

Volatiles

SW846-8240 =

- *Spiked compounds were all recovered within acceptable QA/QC Criteria.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

- *Spiked compounds were all recovered within acceptable QA/QC Criteria.
- *Met 14 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits but Percent Difference was greater than 20% on internal standards.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Metals

Lead-SW7421=

- *Spiked compound was recovered within QC Limits.
- *Met 6 month holding times.
- *COC information verified.

Chromium-SW7191=

- *Spiked compound was recovered within QC Limits.
- *Met 6 month holding times.
- *COC information verified.

Cadmium-SW6010=

- *Spiked compound was recovered within QC Limits.
- *Met 6 month holding times.
- *COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

SOIL

026-001BH 9-9.5 MSD

Lab ID# H9-9505164-13

Date Sampled: 05/03/95

Date Received: 05/04/95

Volatiles

SW846-8240 =

- *Spiked compounds were all recovered within acceptable QA/QC Criteria. All RPD's were within QC Limits.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

- *Spiked compounds were all recovered within acceptable QA/QC Criteria. All RPD's were within QC Limits.
- *Met 14 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits but Percent Difference was greater than 20% on internal standards.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Metals

Lead-SW7421=

- *Spiked compound was recovered within QC Limits. RPD was within QC Limits.
- *Met 6 month holding times.
- *COC information verified.

Chromium-SW7191=

- *Spiked compound was recovered within QC Limits. RPD was within QC Limits.
- *Met 6 month holding times.
- *COC information verified.

Cadmium-SW6010=

- *Spiked compound was recovered within QC Limits. RPD was within QC Limits.
- *Met 6 month holding times.
- *COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

SOIL

026-003BH 0.5-1.5

Lab ID# H9-9505209-01

Date Sampled:

05/04/95

Date Received: 05/05/95

Volatiles

SW846-8240 =

*No hits were detected above the assigned detection limits.

*All met 14 day holding time.

*COC information verified.

*All initial and continuing calibrations were within acceptable QC Limits.

*All surrogate recoveries were within acceptable QC limits.

*Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

*No hits were detected above the assigned detection limits. A dilution factor of 2x was applied but was not stated as to what reason it was performed?

*Met 14 day extraction holding time and 40 day extract holding time.

*COC information verified.

*All initial and continuing calibrations were within acceptable QC Limits but Percent Difference was greater than 20% on a few internal standards.

*All surrogate recoveries were within acceptable QC limits.

*Blanks were clean of any contamination.

Metals

Lead-SW7421=

*Hit was detected at 3.2 mg/kg with the detection limit of 0.4 mg/kg.

*Met 6 month holding times.

*COC information verified.

Chromium-SW7191=

*Hit was detected at 6 mg/kg with the detection limit of 1 mg/kg.

*Met 6 month holding times.

*COC information verified.

Cadmium-SW6010=

*No hit was detected above the assigned detection limit of 8 mg/kg. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 8 mg/kg as opposed to what was requested in the SOW at 0.5 mg/kg. Usability of the data is questionable without a valid explanation of the elevated detection limit.

*Met 6 month holding times.

*COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

SOIL

026-003BH 1.5-2.5

Lab ID# H9-9505209-02

Date Sampled: 05/04/95

Date Received: 05/05/95

Volatiles

SW846-8240 =

- *No hits were detected above the assigned detection limits.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

- *No hits were detected above the assigned detection limits.
- *Met 14 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits but Percent Difference was greater than 20% on a few internal standards.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Metals

Lead-SW7421=

- *Hit was detected at 5.9 mg/kg with the detection limit of 0.4 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Chromium-SW7191=

- *Hit was detected at 18 mg/kg with the detection limit of 2 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Cadmium-SW6010=

- *No hit was detected above the assigned detection limit of 8 mg/kg. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 8 mg/kg as opposed to what was requested in the SOW at 0.5 mg/kg. Usability of the data is questionable without a valid explanation of the elevated detection limit.
- *Met 6 month holding times.
- *COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

SOIL

026-003BH 6.5-7.0

Lab ID# H9-9505209-03

Date Sampled: 05/04/95

Date Received: 05/05/95

Volatiles

SW846-8240 =

- *No hits were detected above the assigned detection limits.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

- *No hits were detected above the assigned detection limits.
- *Met 14 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits but Percent Difference was greater than 20% on a few internal standards.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Metals

Lead-SW7421=

- *Hit was detected at 4.6 mg/kg with the detection limit of 0.4 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Chromium-SW7191=

- *Hit was detected at 3.2 mg/kg with the detection limit of 0.2 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Cadmium-SW6010=

- *No hit was detected above the assigned detection limit of 8 mg/kg. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 8 mg/kg as opposed to what was requested in the SOW at 0.5 mg/kg. Usability of the data is questionable without a valid explanation of the elevated detection limit.
- *Met 6 month holding times.
- *COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

SOIL

026-002BH 2-2.5

Lab ID# H9-9505209-04

Date Sampled: 05/04/95

Date Received: 05/05/95

Volatiles

SW846-8240 =

- *No hits were detected above the assigned detection limits.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

- *No hits were detected above the assigned detection limits.
- *Met 14 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *All RPD's, initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Metals

Lead-SW7421=

- *Hit was detected at 3.2 mg/kg with the detection limit of 0.4 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Chromium-SW7191=

- *Hit was detected at 3.1 mg/kg with the detection limit of 0.2 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Cadmium-SW6010=

- *No hit was detected above the assigned detection limit of 8 mg/kg. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 8 mg/kg as opposed to what was requested in the SOW at 0.5 mg/kg. Usability of the data is questionable without a valid explanation of the elevated detection limit.
- *Met 6 month holding times.
- *COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

SOIL

026-002BH 6.5-7

Lab ID# H9-9505209-05

Date Sampled: 05/04/95

Date Received: 05/05/95

Volatiles

SW846-8240 =

- *No hits were detected above the assigned detection limits.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

- *No hits were detected above the assigned detection limits.
- *Met 14 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits but Percent Difference was greater than 20% on a few internal standards.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Metals

Lead-SW7421=

- *Hit was detected at 1.5 mg/kg with the detection limit of 0.4 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Chromium-SW7191=

- *Hit was detected at 3.8 mg/kg with the detection limit of 0.2 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Cadmium-SW6010=

- *No hit was detected above the assigned detection limit of 8 mg/kg. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 8 mg/kg as opposed to what was requested in the SOW at 0.5 mg/kg. Usability of the data is questionable without a valid explanation of the elevated detection limit.
- *Met 6 month holding times.
- *COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

WATER

026-002 RB

Lab ID# H9-9505209-06

Date Sampled: 05/04/95

Date Received: 05/05/95

Volatiles

SW846-8240 =

- *Hit was detected on Chloroform at 5 ug/l with the detection limit of 5 ug/l.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

- *Hit was detected on 4-Chloro-3-Methylphenol at 8 ug/l above the detection limit of 5 ug/l.
- *Met 7 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *All RPD's, initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Metals

Lead-SW7421=

- *No hit was detected above the assigned detection limit of 0.004 mg/l.
- *Met 6 month holding times.
- *COC information verified.

Chromium-SW7191=

- *No hit was detected above the assigned detection limit of 0.01 mg/l.
- *Met 6 month holding times.
- *COC information verified.

Cadmium-SW6010=

- *No hit was detected above the assigned detection limit of 0.004 mg/l. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 0.004 mg/l as opposed to what was requested in the SOW at 0.0006 mg/l. Usability of the data is questionable without a valid explanation of the elevated detection limit.
- *Met 6 month holding times.
- *COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

WATER

TRIP BLANK

Lab ID# H9-9505209-07

Date Sampled: 4/26/95

Date Received: 05/05/95

Volatiles

SW846-8240 =

- *No hits were detected above the assigned detection limits.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

SAMPLE:

WATER

025-001 RB

Lab ID# H9-9505512-01

Date Sampled: 05/12/95

Date Received: 05/13/95

Volatiles

SW846-8240 =

- *No hit was detected above the assigned detection limits.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

- *Hit was detected on Phenol at 51 ug/l with the detection limit of 5 ug/l.
- *Met 7 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *All RPD's, initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Metals

Lead-SW7421=

- *Hit was detected at 0.006 mg/l above the assigned detection limit of 0.004 mg/l.
- *Met 6 month holding times.
- *COC information verified.

Chromium-SW7191=

- *No hit was detected above the assigned detection limit of 0.01 mg/l.
- *Met 6 month holding times.
- *COC information verified.

Cadmium-SW6010=

- *No hit was detected above the assigned detection limit of 0.004 mg/l. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 0.004 mg/l as opposed to what was requested in the SOW at 0.0006 mg/l. Usability of the data is questionable without a valid explanation of the elevated detection limit.
- *Met 6 month holding times.
- *COC information verified.

Nickel-SW6010=

- *No hit was detected above the assigned detection limit of 0.02 mg/l. Detection limit for this element should be at 0.01 mg/l as compared to 0.02 mg/l. Please provide an explanation for detection variance.
- *Met 6 month holding times.
- *COC information verified.

Mercury-SW7470=

- *No hit was detected above the assigned detection limit of 0.0004 mg/l.
- *Met 6 month holding times.
- *COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

SOIL

025-008BH 10.5-11

Lab ID# H9-9505512-02

Date Sampled: 05/12/95

Date Received: 05/13/95

Volatiles

SW846-8240 =

- *No hits were detected above the assigned detection limits.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

- *No hits were detected above the assigned detection limits.
- *Met 14 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *All RPD's, initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Metals

Lead-SW7421=

- *Hit was detected at 4.6 mg/kg with the detection limit of 0.4 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Chromium-SW7191=

- *Hit was detected at 18 mg/kg with the detection limit of 2 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Cadmium-SW6010=

- *No hit was detected above the assigned detection limit of 0.5 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Nickel-SW6010=

- *Hit was detected at 26 mg/kg with the detection limit of 2 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Mercury-SW7471=

- *No hit was detected above the assigned detection limit of 0.1 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

SOIL

025-008BH 14.5-15

Lab ID# H9-9505512-03

Date Sampled: 05/12/95

Date Received: 05/13/95

Volatiles

SW846-8240 =

*Hits were detected on Ethylbenzene at 30 ug/kg, Toluene at 29 ug/kg, and Xylenes (Total) at 230 ug/kg with detection limits of 5 ug/kg.

*All met 14 day holding time.

*COC information verified.

*All initial and continuing calibrations were within acceptable QC Limits.

*All surrogate recoveries were within acceptable QC limits.

*Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

*No hits were detected above the assigned detection limits.

*Met 14 day extraction holding time and 40 day extract holding time.

*COC information verified.

*All initial and continuing calibrations were within acceptable QC Limits. One RPD was not within limits.

*All surrogate recoveries were within acceptable QC limits.

*Blanks were clean of any contamination.

Metals

Lead-SW7421=

*Hit was detected at 6.8 mg/kg with the detection limit of 0.4 mg/kg.

*Met 6 month holding times.

*COC information verified.

Chromium-SW7191=

*Hit was detected at 12 mg/kg with the detection limit of 1 mg/kg.

*Met 6 month holding times.

*COC information verified.

Cadmium-SW6010=

*No hit was detected above the assigned detection limit of 0.5 mg/kg.

*Met 6 month holding times.

*COC information verified.

Nickel-SW6010=

*Hit was detected at 27 mg/kg with the detection limit of 2 mg/kg.

*Met 6 month holding times.

*COC information verified.

Mercury-SW7471=

*No hit was detected above the assigned detection limit of 0.1 mg/kg.

*Met 6 month holding times.

*COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

SOIL

025-010BH 2-2.5

Lab ID# H9-9505512-04

Date Sampled: 05/12/95

Date Received: 05/13/95

Volatiles

SW846-8240 =

- *No hits were detected above the assigned detection limits.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

- *Hits on Fluoranthene at 420 ug/kg and Pyrene at 360 ug/kg with detection limits 330 ug/kg.
- *Met 14 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits. One RPD was not within limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Metals

Lead-SW7421=

- *Hit was detected at 4.6 mg/kg with the detection limit of 0.4 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Chromium-SW7191=

- *Hit was detected at 15 mg/kg with the detection limit of 1 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Cadmium-SW6010=

- *No hit was detected above the assigned detection limit of 0.5 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Nickel-SW6010=

- *Hit was detected at 20 mg/kg with the detection limit of 2 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Mercury-SW7471=

- *No hit was detected above the assigned detection limit of 0.1 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

SOIL

025-010BH 6-6.5

Lab ID# H9-9505512-05

Date Sampled: 05/12/95

Date Received: 05/13/95

Volatiles

SW846-8240 =

- *Hits were detected on Ethylbenzene at 7 ug/kg, Toluene at 17 ug/kg, and Xylenes (Total) at 5 ug/kg with detection limits of 5 ug/kg.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

- *No hits were detected above the assigned detection limits.
- *Met 14 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits. One RPD was not within limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Metals

Lead-SW7421=

- *Hit was detected at 3.6 mg/kg with the detection limit of 0.4 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Chromium-SW7191=

- *Hit was detected at 19 mg/kg with the detection limit of 1 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Cadmium-SW6010=

- *No hit was detected above the assigned detection limit of 0.5 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Nickel-SW6010=

- *Hit was detected at 25 mg/kg with the detection limit of 2 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Mercury-SW7471=

- *No hit was detected above the assigned detection limit of 0.1 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

SOIL

025-011BH 2-2.5

Lab ID# H9-9505512-06

Date Sampled: 05/12/95

Date Received: 05/13/95

Volatiles

SW846-8240 =

- *No hits were detected above the assigned detection limits.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

- *No hits were detected above the assigned detection limits.
- *Met 14 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *All RPD's, initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Metals

Lead-SW7421=

- *Hit was detected at 5.2 mg/kg with the detection limit of 0.4 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Chromium-SW7191=

- *Hit was detected at 19 mg/kg with the detection limit of 1 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Cadmium-SW6010=

- *No hit was detected above the assigned detection limit of 0.5 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Nickel-SW6010=

- *Hit was detected at 21 mg/kg with the detection limit of 2 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Mercury-SW7471=

- *No hit was detected above the assigned detection limit of 0.1 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

SOIL

025-011BH 6.5-7

Lab ID# H9-9505512-07

Date Sampled: 05/12/95

Date Received: 05/13/95

Volatiles

SW846-8240 =

*Hit was detected on Xylenes (Total) at 6 ug/kg with the detection limit of 5 ug/kg. Please confirm why Acetone at 53 ug/kg and 2-Butanone at 15 ug/kg were not quantitated on the report forms.

*All met 14 day holding time.

*COC information verified.

*All initial and continuing calibrations were within acceptable QC Limits.

*All surrogate recoveries were within acceptable QC limits.

*Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

*No hits were detected above the assigned detection limits. A 10x dilution was noted as being performed but the accompanying raw data displays only a 1x dilution. Also, the Quantitation Report does not display surrogate on the listing, only the internal standards.

*Met 14 day extraction holding time and 40 day extract holding time.

*COC information verified.

*All RPD's, initial and continuing calibrations were within acceptable QC Limits.

*All surrogate recoveries were diluted outside acceptable QC limits.

*Blanks were clean of any contamination.

Metals

Lead-SW7421=

*Hit was detected at 6.3 mg/kg with the detection limit of 0.4 mg/kg.

*Met 6 month holding times.

*COC information verified.

Chromium-SW7191=

*Hit was detected at 17 mg/kg with the detection limit of 1 mg/kg.

*Met 6 month holding times.

*COC information verified.

Cadmium-SW6010=

*No hit was detected above the assigned detection limit of 0.5 mg/kg.

*Met 6 month holding times.

*COC information verified.

Nickel-SW6010=

*Hit was detected at 18 mg/kg with the detection limit of 2 mg/kg.

*Met 6 month holding times.

*COC information verified.

Mercury-SW7471=

*No hit was detected above the assigned detection limit of 0.1 mg/kg.

*Met 6 month holding times.

*COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

SOIL

025-006BH 21.5-22

Lab ID# H9-9505512-08

Date Sampled: 05/12/95

Date Received: 05/13/95

Volatiles

SW846-8240 =

*Hit was detected on Xylenes (Total) at 5 ug/kg with the detection limit of 5 ug/kg. Please confirm whv Acetone at 36 ug/kg and 2-Butanone at 12 ug/kg were not quantitated on the report forms.

*All met 14 day holding time.

*COC information verified.

*All initial and continuing calibrations were within acceptable QC Limits.

*All surrogate recoveries were within acceptable QC limits.

*Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

*No hits were detected above the assigned detection limits. A 3x dilution was noted as being performed but the accompaning raw data displays only a 1x dilution.

*Met 14 day extraction holding time and 40 day extract holding time.

*COC information verified.

*All RPD's, initial and continuing calibrations were within acceptable QC Limits.

*All surrogate recoveries were within acceptable QC limits.

*Blanks were clean of any contamination.

Metals

Lead-SW7421=

*Hit was detected at 7.6 mg/kg with the detection limit of 0.4 mg/kg.

*Met 6 month holding times.

*COC information verified.

Chromium-SW7191=

*Hit was detected at 16 mg/kg with the detection limit of 1 mg/kg.

*Met 6 month holding times.

*COC information verified.

Cadmium-SW6010=

*No hit was detected above the assigned detection limit of 0.5 mg/kg.

*Met 6 month holding times.

*COC information verified.

Nickel-SW6010=

*Hit was detected at 18 mg/kg with the detection limit of 2 mg/kg.

*Met 6 month holding times.

*COC information verified.

Mercury-SW7471=

*No hit was detected above the assigned detection limit of 0.1 mg/kg.

*Met 6 month holding times.

*COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

SOIL

025-009BH 10-11

Lab ID# H9-9505512-09

Date Sampled: 05/12/95

Date Received: 05/13/95

Volatiles

SW846-8240 =

- *No hits were detected above the assigned detection limits.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits. Two Internal Standard % Differences were greater than 20% in ratio but were within QC Area Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

- *No hits were detected above the assigned detection limits.
- *Met 14 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *All RPD's, initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Metals

Lead-SW7421=

- *Hit was detected at 5.8 mg/kg with the detection limit of 0.4 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Chromium-SW7191=

- *Hit was detected at 24 mg/kg with the detection limit of 1 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Cadmium-SW6010=

- *No hit was detected above the assigned detection limit of 0.5 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Nickel-SW6010=

- *Hit was detected at 22 mg/kg with the detection limit of 2 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Mercury-SW7471=

- *No hit was detected above the assigned detection limit of 0.1 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:**SOIL**

025-009BH 11-12

Lab ID# H9-9505512-10

Date Sampled: 05/12/95

Date Received: 05/13/95

Volatiles

SW846-8240 =

- *No hits were detected above the assigned detection limits.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

- *No hits were detected above the assigned detection limits.
- *Met 14 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *All RPD's, initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Metals

Lead-SW7421=

- *Hit was detected at 5.5 mg/kg with the detection limit of 0.4 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Chromium-SW7191=

- *Hit was detected at 18 mg/kg with the detection limit of 1 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Cadmium-SW6010=

- *No hit was detected above the assigned detection limit of 0.5 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Nickel-SW6010=

- *Hit was detected at 19 mg/kg with the detection limit of 2 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Mercury-SW7471=

- *No hit was detected above the assigned detection limit of 0.1 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

SOIL

025-009BH 14-14.5

Lab ID# H9-9505512-11

Date Sampled: 05/12/95

Date Received: 05/13/95

Volatiles

SW846-8240 =

*Hit was detected on Xylenes (Total) at 8 ug/kg with the detection limit of 5 ug/kg. Please confirm whv Acetone at 54 ug/kg and 2-Butanone at 17 ug/kg were not quantitated on the report forms.

*All met 14 day holding time.

*COC information verified.

*All initial and continuing calibrations were within acceptable QC Limits.

*All surrogate recoveries were within acceptable QC limits.

*Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

*No hits were detected above the assigned detection limits.

*Met 14 day extraction holding time and 40 day extract holding time.

*COC information verified.

*All RPD's, initial and continuing calibrations were within acceptable QC Limits.

*All surrogate recoveries were within acceptable QC limits.

*Blanks were clean of any contamination.

Metals

Lead-SW7421=

*Hit was detected at 3.8 mg/kg with the detection limit of 0.4 mg/kg.

*Met 6 month holding times.

*COC information verified.

Chromium-SW7191=

*Hit was detected at 17 mg/kg with the detection limit of 1 mg/kg.

*Met 6 month holding times.

*COC information verified.

Cadmium-SW6010=

*No hit was detected above the assigned detection limit of 0.5 mg/kg.

*Met 6 month holding times.

*COC information verified.

Nickel-SW6010=

*Hit was detected at 18 mg/kg with the detection limit of 2 mg/kg.

*Met 6 month holding times.

*COC information verified.

Mercury-SW7471=

*No hit was detected above the assigned detection limit of 0.1 mg/kg.

*Met 6 month holding times.

*COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

SOIL

025-009BH 14.5-15 MS

Lab ID# H9-9505512-12

Date Sampled: 05/12/95

Date Received: 05/13/95

*Sample ID Name needs to read 025-009BH 14.5-15 from 025-009BH 14-14.5 MS. Please Correct.

Volatiles

SW846-8240 =

- *All spiked compounds were recovered within QC acceptance criteria.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Metals

Lead-SW7421=

- *Spiked amount was recovered within QC acceptable criteria.
- *Met 6 month holding times.
- *COC information verified.

Chromium-SW7191=

- *Spiked amount was recovered within QC acceptance criteria.
- *Met 6 month holding times.
- *COC information verified.

Cadmium-SW7610=

- *Spiked amount was recovered within QC acceptance criteria.
- *Met 6 month holding times.
- *COC information verified.

Nickel-SW6010=

- *Spiked amount was recovered within QC acceptance criteria.
- *Met 6 month holding times.
- *COC information verified.

Mercury-SW7471=

- *Spiked amount was recovered within QC acceptance criteria.
- *Met 6 month holding times.
- *COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

SOIL

025-009BH 14.5-15 MSD

Lab ID# H9-9505512-13

Date Sampled: 05/12/95

Date Received: 05/13/95

*Sample ID Name needs to read 025-009BH 14.5-15 from 025-009BH 14-14.5 MSD. Please Correct.

Volatiles

SW846-8240 =

- *All spiked compounds were recovered within QC acceptance criteria. All RPD's are within QC Criteria.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Metals

Lead-SW7421=

- *Spiked amount was recovered within QC acceptable criteria. All RPD's are within QC Criteria.
- *Met 6 month holding times.
- *COC information verified.

Chromium-SW7191=

- *Spiked amount was recovered within QC acceptance criteria. All RPD's are within QC Criteria.
- *Met 6 month holding times.
- *COC information verified.

Cadmium-SW6010=

- *Spiked amount was recovered within QC acceptance criteria. All RPD's are within QC Criteria.
- *Met 6 month holding times.
- *COC information verified.

Nickel-SW6010=

- *Spiked amount was recovered within QC acceptance criteria. All RPD's are within QC Criteria.
- *Met 6 month holding times.
- *COC information verified.

Mercury-SW7471=

- *Spiked amount was recovered within QC acceptance criteria. All RPD's are within QC Criteria.
- *Met 6 month holding times.
- *COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

SOIL

025-008BH 10.5-11 MS

Lab ID# H9-9505512-14

Date Sampled: 05/12/95

Date Received: 05/13/95

Semivolatiles

SW846-8270 ==

*All spiked compounds were recovered within QC acceptable criteria.

*Met 14 day extraction holding time and 40 day extract holding time.

*COC information verified.

*All initial and continuing calibrations were within acceptable QC Limits. Internal Standard RPD's were not within QC Criteria but with areas remaining within.

*All surrogate recoveries were within acceptable QC limits.

*Blanks were clean of any contamination.

SAMPLE:

SOIL

025-008BH 10.5-11

Lab ID# H9-9505512-15

Date Sampled: 05/12/95

Date Received: 05/13/95

Semivolatiles
SW846-8270 =

- *All spiked compounds were recovered within QC acceptable criteria. All RPD's were within QC Criteria.
- *Met 14 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits. Internal Standard RPD's were not within QC Criteria but with areas remaining within.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

SAMPLE:

WATER

025-001 TB

Lab ID# H9-9505556-01

Date Sampled:

05/15/95

Date Received: 05/16/95

Volatiles

SW846-8240 =

- *No hits were detected above the assigned detection limits.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

SAMPLE:

SOIL

025-001BH 6.5-7.0

Lab ID# H9-9505556-02

Date Sampled: 05/15/95

Date Received: 05/16/95

Volatiles

SW846-8240 =

*Hits were detected on Benzene at 84,000 ug/kg, Ethylbenzene at 140,000 ug/kg, Toluene at 460,000 ug/kg, and Xylenes (Total) at 680,000 ug/kg with detection limits of 12,000 ug/kg. Dilution Factor of 2,500x was applied for analysis.

*All met 14 day holding time.

*COC information verified.

*All initial and continuing calibrations were within acceptable QC Limits.

*All surrogate recoveries were within acceptable QC limits. All surrogate recoveries for the Diluted analysis were recovered outside of QC Range.

*Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

*Hits were detected on 2-Methylnaphthalene at 12,000 ug/kg, Naphthalene at 14,000 ug/kg with detection limits of 3,300 ug/kg and Phenol at 350 ug/kg with the detection limit of 330 ug/kg. A 10x dilution was performed for this analysis.

*Met 14 day extraction holding time and 40 day extract holding time.

*COC information verified.

*All RPD's, initial and continuing calibrations were within acceptable QC Limits.

*All surrogate recoveries were within acceptable QC limits. All surrogates for the 10x dilution were diluted out of QC Range.

*Blanks were clean of any contamination.

Metals

Lead-SW7421=

*Hit was detected at 3.2 mg/kg with the detection limit of 0.4 mg/kg.

*Met 6 month holding times.

*COC information verified.

Chromium-SW7191=

*Hit was detected at 9 mg/kg with the detection limit of 1 mg/kg.

*Met 6 month holding times.

*COC information verified.

Cadmium-SW6010=

*No hit was detected above the assigned detection limit of 0.4 mg/kg.

*Met 6 month holding times.

*COC information verified.

Nickel-SW6010=

*Hit was detected at 25 mg/kg with the detection limit of 2 mg/kg.

*Met 6 month holding times.

*COC information verified.

Mercury-SW7471=

*No hit was detected above the assigned detection limit of 0.1 mg/kg.

*Met 6 month holding times.

*COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:**SOIL**

025-002BH 11.5-12.0

Lab ID# H9-9505556-03

Date Sampled: 05/15/95

Date Received: 05/16/95

Volatiles

SW846-8240 =

*Hits were detected on Benzene at 1,700 ug/kg, Ethylbenzene at 9,700 ug/kg, Toluene at 26,000 ug/kg, and Xylenes (Total) at 52,000 ug/kg with detection limits of 12,000 ug/kg. Dilution Factor of 250x was applied for analysis.

*All met 14 day holding time.

*COC information verified.

*All initial and continuing calibrations were within acceptable QC Limits.

*All surrogate recoveries were within acceptable QC limits. All surrogates were diluted out of QC Range for the diluted sample.

*Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

*Hits were detected on 2-Methylnaphthalene at 2,300 ug/kg and Naphthalene at 2,100 ug/kg with detection limits of 330 ug/kg

*Met 14 day extraction holding time and 40 day extract holding time.

*COC information verified.

*All RPD's, initial and continuing calibrations were within acceptable QC Limits.

*All surrogate recoveries were within acceptable QC limits.

*Blanks were clean of any contamination.

Metals

Lead-SW7421=

*Hit was detected at 1.7 mg/kg with the detection limit of 0.4 mg/kg.

*Met 6 month holding times.

*COC information verified.

Chromium-SW7191=

*Hit was detected at 6 mg/kg with the detection limit of 1 mg/kg.

*Met 6 month holding times.

*COC information verified.

Cadmium-SW6010=

*No hit was detected above the assigned detection limit of 0.4 mg/kg.

*Met 6 month holding times.

*COC information verified.

Nickel-SW6010=

*Hit was detected at 21 mg/kg with the detection limit of 2 mg/kg.

*Met 6 month holding times.

*COC information verified.

Mercury-SW7471=

*No hit was detected above the assigned detection limit of 0.1 mg/kg.

*Met 6 month holding times.

*COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

SOIL

025-003BH 11-12

Lab ID# H9-9505556-04

Date Sampled: 05/15/95 -- Date Received: 05/16/95

Volatiles

SW846-8240 =

- *Hits were detected on Ethylbenzene at 120 ug/kg and Xylenes (Total) at 800 ug/kg with detection limits of 25 ug/kg. Dilution Factor of 5x was applied for analysis.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

- *No hits were detected above the assigned detection limits.
- *Met 14 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *All RPD's, initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Metals

Lead-SW7421=

- *Hit was detected at 3.0 mg/kg with the detection limit of 0.4 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Chromium-SW7191=

- *Hit was detected at 15 mg/kg with the detection limit of 2 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Cadmium-SW6010=

- *No hit was detected above the assigned detection limit of 0.4 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Nickel-SW6010=

- *Hit was detected at 22 mg/kg with the detection limit of 2 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Mercury-SW7471=

- *No hit was detected above the assigned detection limit of 0.1 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

SOIL

025-003BH 10'-11'

Lab ID# H9-9505556-05

Date Sampled: 05/15/95

Date Received: 05/16/95

Volatiles

SW846-8240 =

*Hits were detected on Ethylbenzene at 5,300 ug/kg and Xylenes (Total) at 29,000 ug/kg with detection limits of 1,200 ug/kg. Dilution Factor of 250x was applied for analysis.

*All met 14 day holding time.

*COC information verified.

*All initial and continuing calibrations were within acceptable QC Limits.

*All surrogate recoveries were within acceptable QC limits. Surrogates that were applied to the dilution were diluted out of QC Range.

*Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

*Hit was detected on 2-Methylnapthalene at 330 ug/kg with the detection limit of 330 ug/kg.

*Met 14 day extraction holding time and 40 day extract holding time.

*COC information verified.

*One RPD's was outside QC Limits; Initial and continuing calibrations were within acceptable QC Limits.

*All surrogate recoveries were within acceptable QC limits.

*Blanks were clean of any contamination.

Metals

Lead-SW7421=

*Hit was detected at 2.6 mg/kg with the detection limit of 0.4 mg/kg.

*Met 6 month holding times.

*COC information verified.

Chromium-SW7191=

*Hit was detected at 11 mg/kg with the detection limit of 2 mg/kg.

*Met 6 month holding times.

*COC information verified.

Cadmium-SW6010=

*Hit was detected at 0.5 mg/kg with a detection limit of 0.4 mg/kg.

*Met 6 month holding times.

*COC information verified.

Nickel-SW6010=

*Hit was detected at 26 mg/kg with the detection limit of 2 mg/kg.

*Met 6 month holding times.

*COC information verified.

Mercury-SW7471=

*No hit was detected above the assigned detection limit of 0.1 mg/kg.

*Met 6 month holding times.

*COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

WATER

025-003 TB

Lab ID# H9-9505612-01

Date Sampled: 05/16/95

Date Received: 05/17/95

Volatiles

SW846-8240 =

- *No hits were detected above the assigned detection limits.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

SAMPLE:

WATER

025-002 RB

Lab ID# H9-9505612-02

Date Sampled:

05/16/95

Date Received: 05/17/95

Volatiles

SW846-8240 =

- *Hit was detected on Chloroform at 5 ug/l with the detection limit of 5 ug/l.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

- *Hit was detected on Di-n-butylphthalate at 5 ug/l with the detection limit of 5 ug/l.
- *Met 7 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *Initial and continuing calibrations had % Differences that were outside QC Ranges but within area QC Limits..
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Metals

Lead-SW7421=

- *Hit was detected at 0.006 mg/l above the assigned detection limit of 0.004 mg/l.
- *Met 6 month holding times.
- *COC information verified.

Chromium-SW7191=

- *No hit was detected above the assigned detection limit of 0.002 mg/l.
- *Met 6 month holding times.
- *COC information verified.

Cadmium-SW6010=

- *No hit was detected above the assigned detection limit of 0.004 mg/l. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 0.004 mg/l as opposed to what was requested in the SOW at 0.0006 mg/l. Usability of the data is questionable without a valid explanation of the elevated detection limit.
- *Met 6 month holding times.
- *COC information verified.

Nickel-SW6010=

- *No hit was detected above the assigned detection limit of 0.02 mg/l. Detection limit for this element should be at 0.01 mg/l as compared to 0.02 mg/l. Please provide an explanation for detection variance.
- *Met 6 month holding times.
- *COC information verified.

Mercury-SW7470=

- *No hit was detected above the assigned detection limit of 0.0004 mg/l.
- *Met 6 month holding times.
- *COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

SOIL

025-007BH 11.5'-12'

Lab ID# H9-9505612-03

Date Sampled: 05/16/95

Date Received: 05/17/95

Volatiles

SW846-8240 =

- *No hits were detected above the assigned detection limits.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

- *No hits were detected above the assigned detection limits.
- *Met 14 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *Initial and continuing calibrations had % Differences that were outside QC Ranges but within area QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Metals

Lead-SW7421=

- *Hit was detected at 6.1 mg/kg with the detection limit of 0.4 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Chromium-SW7191=

- *Hit was detected at 6 mg/kg with the detection limit of 1 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Cadmium-SW6010=

- *No hit was detected above the detection limit of 0.4 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Nickel-SW6010=

- *Hit was detected at 16 mg/kg with the detection limit of 2 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Mercury-SW7471=

- *No hit was detected above the assigned detection limit of 0.1 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

025-005BH 11.5'-12'

Date Sampled: 05/16/95

SOIL

Lab ID# H9-9505612-04

Date Received: 05/17/95

Volatiles

SW846-8240 =

- *No hits were detected above the assigned detection limits.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

- *No hits were detected above the assigned detection limits.
- *Met 14 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *Initial and continuing calibrations had % Differences that were outside QC Ranges but within area QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Metals

Lead-SW7421=

- *Hit was detected at 1.9 mg/kg with the detection limit of 0.4 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Chromium-SW7191=

- *Hit was detected at 6 mg/kg with the detection limit of 1 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Cadmium-SW6010=

- *No hit was detected above the detection limit of 0.5 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Nickel-SW6010=

- *Hit was detected at 17 mg/kg with the detection limit of 2 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Mercury-SW7471=

- *No hit was detected above the assigned detection limit of 0.1 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

025-004BH 11.5'-12'

Date Sampled: 05/16/95

SOIL

Lab ID# H9-9505612-05

Date Received: 05/17/95

Volatiles

SW846-8240 =

- *No hits were detected above the assigned detection limits.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

- *No hits were detected above the assigned detection limits.
- *Met 14 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *Initial and continuing calibrations had % Differences that were outside QC Ranges but within area QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Metals

Lead-SW7421=

- *Hit was detected at 2.0 mg/kg with the detection limit of 0.4 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Chromium-SW7191=

- *Hit was detected at 9 mg/kg with the detection limit of 1 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Cadmium-SW6010=

- *No hit was detected above the detection limit of 0.5 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Nickel-SW6010=

- *Hit was detected at 17 mg/kg with the detection limit of 2 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Mercury-SW7471=

- *No hit was detected above the assigned detection limit of 0.1 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

SOIL

025-004BH 19.5'-20'

Lab ID# H9-9505612-06

Date Sampled: 05/16/95

Date Received: 05/17/95

Volatiles

SW846-8240 =

- *No hits were detected above the assigned detection limits.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

- *No hits were detected above the assigned detection limits.
- *Met 14 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *Initial and continuing calibrations had % Differences that were outside QC Ranges but within area QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Metals

Lead-SW7421=

- *Hit was detected at 4.5 mg/kg with the detection limit of 0.4 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Chromium-SW7191=

- *Hit was detected at 18 mg/kg with the detection limit of 1 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Cadmium-SW6010=

- *No hit was detected above the detection limit of 0.5 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Nickel-SW6010=

- *Hit was detected at 23 mg/kg with the detection limit of 2 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Mercury-SW7471=

- *No hit was detected above the assigned detection limit of 0.1 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

025-003 RB

WATER

Lab ID# H9-9505767-01

Date Sampled: 05/19/95

Date Received: 05/20/95

Volatiles
SW846-8010 =

- *Hits were detected on Chloroform at 5 ug/l and Methylene Chloride at 4 ug/l with the detection limit of 1 ug/l.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.
- *Missing BTEX raw data and chromatograms for this sample.

Volatiles
SW846-8020 =

- *No hits were detected above the assigned detection limits of 1 ug/l.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.
- *Missing raw data and chromatograms for this sample.

Semivolatiles
SW846-8270 =

- *Hit was detected on Di-n-butylphthalate at 5 ug/l with the detection limit of 5 ug/l.
- *Met 7 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *Initial and continuing calibrations had % Differences that were outside QC Ranges but within area QC Limits..
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Metals

Lead-SW7421=

- *No hit was detected above the assigned detection limit of 0.004 mg/l.
- *Met 6 month holding times.
- *COC information verified.

Chromium-SW7191=

- *No hit was detected above the assigned detection limit of 0.002 mg/l.
- *Met 6 month holding times.
- *COC information verified.

Cadmium-SW6010=

- *No hit was detected above the assigned detection limit of 0.005 mg/l. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 0.005 mg/l as opposed to what was requested in the SOW at 0.0006 mg/l. Usability of the data is questionable without a valid explanation of the elevated detection limit.
- *Met 6 month holding times.
- *COC information verified.

Nickel-SW6010=

- *No hit was detected above the assigned detection limit of 0.02 mg/l. Detection limit for this element should be at 0.01 mg/l as compared to 0.02 mg/l. Please provide an explanation for detection variance.
- *Met 6 month holding times.
- *COC information verified.

Mercury-SW7470=

- *No hit was detected above the assigned detection limit of 0.0004 mg/l.
- *Met 6 month holding times.
- *COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

WATER

SI-002FB

Lab ID# H9-9505767-02

Date Sampled: 05/19/95

Date Received: 05/20/95

Volatiles

SW846-8260 =

- *Hit was detected on Chloroform at 6 ug/l with the detection limit of 5 ug/l.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

*It was noted on the COC to perform a Semi-volatile analysis but the laboratory received the sample broken and informed us to not being able to perform the analysis. But, Raw data was accompanied with the sample report forms and not documented on the report forms.

Metals

Lead-SW7421=

- *No hit was detected above the assigned detection limit of 0.004 mg/l.
- *Met 6 month holding times.
- *COC information verified.

Chromium-SW7191=

- *No hit was detected above the assigned detection limit of 0.002 mg/l.
- *Met 6 month holding times.
- *COC information verified.

Cadmium-SW6010=

- *No hit was detected above the assigned detection limit of 0.005 mg/l. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 0.005 mg/l as opposed to what was requested in the SOW at 0.0006 mg/l. Usability of the data is questionable without a valid explanation of the elevated detection limit.
- *Met 6 month holding times.
- *COC information verified.

Nickel-SW6010=

- *No hit was detected above the assigned detection limit of 0.02 mg/l. Detection limit for this element should be at 0.01 mg/l as compared to 0.02 mg/l. Please provide an explanation for detection variance.
- *Met 6 month holding times.
- *COC information verified.

Mercury-SW7470=

- *No hit was detected above the assigned detection limit of 0.0004 mg/l.
- *Met 6 month holding times.
- *COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

025-001-MW-GW01

WATER

Lab ID# H9-9505767-03

Date Sampled: 05/19/95

Date Received: 05/20/95

Volatiles

SW846-8010 =

- *No hits were detected above the assigned detection of 1 ug/l.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.
- *Missing BTEX raw data and chromatograms for this sample.

Volatiles

SW846-8020 =

- *No hits were detected above the assigned detection limits of 1 ug/l.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.
- *Missing raw data and chromatograms for this sample.

Semivolatiles

SW846-8270 =

- *No hits were detected above the assigned detection.
- *Met 7 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.
- *Missing raw data and chromatograms.

Metals

Lead-SW7421=

- *Hit was detected at 0.008 mg/l above the assigned detection limit of 0.004 mg/l.
- *Met 6 month holding times.
- *COC information verified.

Chromium-SW7191=

- *Hit was detected at 0.036 mg/l above the assigned detection limit of 0.002 mg/l.
- *Met 6 month holding times.
- *COC information verified.

Cadmium-SW6010=

- *No hit was detected above the assigned detection limit of 0.005 mg/l. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 0.005 mg/l as opposed to what was requested in the SOW at 0.0006 mg/l. Usability of the data is questionable without a valid explanation of the elevated detection limit.
- *Met 6 month holding times.
- *COC information verified.

Nickel-SW6010=

- *Hit was detected at 0.07 mg/l above the assigned detection limit of 0.02 mg/l.
- *Met 6 month holding times.
- *COC information verified.

Mercury-SW7470=

- *No hit was detected above the assigned detection limit of 0.0004 mg/l.
- *Met 6 month holding times.
- *COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

WATER

025-TB

Lab ID# H9-9505767-04

Date Sampled:

05/19/95

Date Received: 05/20/95

Volatiles

SW846-8010 =

*No hits were detected above the assigned detection of 1 ug/l.

*All met 14 day holding time.

*COC information verified.

*All initial and continuing calibrations were within acceptable QC Limits.

*All surrogate recoveries were within acceptable QC limits.

*Blanks were clean of any contamination.

*Missing BTEX raw data and chromatograms for this sample.

Volatiles

SW846-8020 =

*Hit was detected at Methylene Chloride at 3 ug/l above the assigned detection limits of 1 ug/l. Hit was confirmed to be detected in the method blank.

*All met 14 day holding time.

*COC information verified.

*All initial and continuing calibrations were within acceptable QC Limits.

*All surrogate recoveries were within acceptable QC limits.

*Blanks were clean of any contamination.

*Missing raw data and chromatograms for this sample.

SAMPLE:

WATER

025-003 MW-GW04

Lab ID# H9-9505767-05

Date Sampled:

05/19/95

Date Received: 05/20/95

Volatiles

SW846-8010 =

- *Hit was detected on Methylene Chloride at 30 ug/l with the detection limit of 25 ug/l. A 25x dilution factor was applied.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.
- *Missing BTEX raw data and chromatograms for this sample.

Volatiles

SW846-8020 =

- *Hits were detected for Total BTEX at 5,920 ug/l above the assigned detection limits of 5 ug/l.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.
- *Missing raw data and chromatograms for this sample.

Semivolatiles

SW846-8270 =

- *Hit was detected on 2-Methylnaphthalene at 11 ug/l, 4-Methylphenol at 9 ug/l, Naphthalene at 75 ug/l, and Phenol at 15 ug/l with the detection limits of 5 ug/l.
- *Met 7 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *Initial and continuing calibrations had % Differences that were outside QC Ranges but within area QC Limits..
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Metals

Lead-SW7421=

- *Hit was detected at 0.005 mg/l above the assigned detection limit of 0.004 mg/l.
- *Met 6 month holding times.
- *COC information verified.

Chromium-SW7191=

- *Hit was detected at 0.015 mg/l with the assigned detection limit of 0.002 mg/l.
- *Met 6 month holding times.
- *COC information verified.

Cadmium-SW6010=

- *No hit was detected above the assigned detection limit of 0.005 mg/l. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 0.005 mg/l as opposed to what was requested in the SOW at 0.0006 mg/l. Usability of the data is questionable without a valid explanation of the elevated detection limit.
- *Met 6 month holding times.
- *COC information verified.

Nickel-SW6010=

- *Hit was detected at 0.03 ug/l above the assigned detection limit of 0.02 mg/l.
- *Met 6 month holding times.
- *COC information verified.

Mercury-SW7470=

- *No hit was detected above the assigned detection limit of 0.0004 mg/l.
- *Met 6 month holding times.
- *COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

WATER

025-003A-GW01

Lab ID# H9-9505767-06

Date Sampled:

05/19/95

Date Received: 05/20/95

Volatiles

SW846-8010 =

*No hits were detected above the assigned detection limits. A 25x dilution was performed on this analysis but no hits were encountered, what was the reason for the dilution?

*All met 14 day holding time.

*COC information verified.

*All initial and continuing calibrations were within acceptable QC Limits.

*All surrogate recoveries were within acceptable QC limits.

*Blanks were clean of any contamination.

*Missing BTEX raw data and chromatograms for this sample.

Volatiles

SW846-8020 =

*Hits were detected for Total BTEX at 5,530 ug/l above the assigned detection limits of 5 ug/l.

*All met 14 day holding time.

*COC information verified.

*All initial and continuing calibrations were within acceptable QC Limits.

*All surrogate recoveries were within acceptable QC limits.

*Blanks were clean of any contamination.

*Missing raw data and chromatograms for this sample.

Semivolatiles

SW846-8270 =

*Hit was detected on 2-Methylnaphthalene at 8 ug/l, 4-Methylphenol at 8 ug/l, Naphthalene at 51 ug/l, and Phenol at 12 ug/l with the detection limits of 5 ug/l.

*Met 7 day extraction holding time and 40 day extract holding time.

*COC information verified.

*Initial and continuing calibrations had % Differences that were outside QC Ranges but within area QC Limits..

*All surrogate recoveries were within acceptable QC limits.

*Blanks were clean of any contamination.

Metals

Lead-SW7421=

*Hit was detected at 0.007 mg/l above the assigned detection limit of 0.004 mg/l.

*Met 6 month holding times.

*COC information verified.

Chromium-SW7191=

*Hit was detected at 0.019 mg/l with the assigned detection limit of 0.002 mg/l.

*Met 6 month holding times.

*COC information verified.

Cadmium-SW6010=

*No hit was detected above the assigned detection limit of 0.005 mg/l. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 0.005 mg/l as opposed to what was requested in the SOW at 0.0006 mg/l. Usability of the data is questionable without a valid explanation of the elevated detection limit.

*Met 6 month holding times.

*COC information verified.

Nickel-SW6010=

*Hit was detected at 0.04 ug/l above the assigned detection limit of 0.02 mg/l.

*Met 6 month holding times.

*COC information verified.

Mercury-SW7470=

*No hit was detected above the assigned detection limit of 0.0004 mg/l.

*Met 6 month holding times.

*COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

WATER

026-002-MW-GW1

Lab ID# H9-9505714-01

Date Sampled: 05/18/95

Date Received: 05/19/95

Volatiles

SW846-8260 =

- *No hits were detected above the assigned detection limits.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

- *No hits were detected above the assigned detection limits.
- *Met 7 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *Initial and continuing calibrations had % Differences that were outside QC Ranges but within area QC Limits..
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

SAMPLE:

WATER

026-003A-MW-GW1

Lab ID# H9-9505714-02

Date Sampled: 05/18/95

Date Received: 05/19/95

Volatiles

SW846-8260 =

- *No hits were detected above the assigned detection limits.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

- *No hits were detected above the assigned detection limits.
- *Met 7 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *Initial and continuing calibrations had % Differences that were outside QC Ranges but within area QC Limits..
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

SAMPLE:

WATER

026-001-MW-GW1

Lab ID# H9-9505714-03

Date Sampled: 05/18/95

Date Received: 05/19/95

Volatiles

SW846-8260 =

- *No hits were detected above the assigned detection limits.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

- *No hits were detected above the assigned detection limits.
- *Met 7 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *Initial and continuing calibrations had % Differences that were outside QC Ranges but within area QC Limits..
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

SAMPLE:

WATER

SI-001-FB

Lab ID# H9-9505714-05

Date Sampled: 05/18/95

Date Received: 05/19/95

Volatiles

SW846-8260 =

- *Hit on Chloroform at 5 ug/l was detected with a detection limit of 1 ug/l.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

- *Hit was detected on Di-n-butylphthalate at 5 ug/l with the detection limit of 5 ug/l.
- *Met 7 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *Initial and continuing calibrations had % Differences that were outside QC Ranges but within area QC Limits..
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Metals

Lead-SW7421=

- *No hit was detected above the assigned detection limit of 0.004 mg/l.
- *Met 6 month holding times.
- *COC information verified.

Chromium-SW7191=

- *No hit was detected above the assigned detection limit of 0.002 mg/l.
- *Met 6 month holding times.
- *COC information verified.

Cadmium-SW6010=

- *No hit was detected above the assigned detection limit of 0.005 mg/l. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 0.005 mg/l as opposed to what was requested in the SOW at 0.0006 mg/l. Usability of the data is questionable without a valid explanation of the elevated detection limit.
- *Met 6 month holding times.
- *COC information verified.

Nickel-SW6010=

- *No hit was detected above the assigned detection limit of 0.02 mg/l. The limit for Nickel as stated in the SOW is to be at 0.01 mg/l but is reported at 0.02 mg/l. Please explain the variance in the detection limits.
- *Met 6 month holding times.
- *COC information verified.

Mercury-SW7470=

- *No hit was detected above the assigned detection limit of 0.0004 mg/l.
- *Met 6 month holding times.
- *COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

WATER

SI-001-TB

Lab ID# H9-9505714-06

Date Sampled: 05/8/95 Date Received: 05/19/95

Volatiles

SW846-8260 =

- *No hits were detected above the assigned detection limits.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

SAMPLE:

WATER

026-003-RB

Lab ID# H9-9505714-07

Date Sampled: 05/18/95

Date Received: 05/19/95

Volatiles

SW846-8260 =

- *Hit was detected on Chloroform at 4 ug/l and Methylene Chloride at 3 ug/l with detection limits of 1 ug/l.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

- *No hits were detected above the assigned detection limits.
- *Met 7 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *Initial and continuing calibrations had % Differences that were outside QC Ranges but within area QC Limits..
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

SAMPLE:

WATER

025-002-MW-GW1

Lab ID# H9-9505714-08

Date Sampled:

05/18/95

Date Received: 05/19/95

Volatiles

SW846-8010 =

- *Hit was detected on 1,2-Dichloroethane at 11 ug/l with the detection limit of 1 ug/l.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.
- *Missing raw data and chromatograms for this sample.

Volatiles

SW846-8020 =

- *Hits were detected for Total BTEX at 1 ug/l above the assigned detection limits of 1 ug/l.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.
- *Missing BTEX raw data and chromatograms for this sample.

Semivolatiles

SW846-8270 =

- *No hits were detected above the assigned detection limits.
- *Met 7 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *Initial and continuing calibrations had % Differences that were outside QC Ranges but within area QC Limits..
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Metals

Lead-SW7421=

- *No hit was detected above the assigned detection limit of 0.004 mg/l.
- *Met 6 month holding times.
- *COC information verified.

Chromium-SW7191=

- *Hit was detected at 0.011 mg/l with the assigned detection limit of 0.002 mg/l.
- *Met 6 month holding times.
- *COC information verified.

Cadmium-SW6010=

- *No hit was detected above the assigned detection limit of 0.005 mg/l. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 0.005 mg/l as opposed to what was requested in the SOW at 0.0006 mg/l. Usability of the data is questionable without a valid explanation of the elevated detection limit.
- *Met 6 month holding times.
- *COC information verified.

Nickel-SW6010=

- *Hit was detected at 0.03 ug/l above the assigned detection limit of 0.02 mg/l.
- *Met 6 month holding times.
- *COC information verified.

Mercury-SW7470=

- *No hit was detected above the assigned detection limit of 0.0004 mg/l.
- *Met 6 month holding times.
- *COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:**SOIL**

025-012BH 11.5'-12'

Lab ID# H9-9505673-02

Date Sampled: 05/17/95

Date Received: 05/18/95

Volatiles

SW846-8240 =

- *Hits were detected on Benzene at 29 ug/kg, Toluene at 8 ug/kg, and Xylenes (Total) at 11 ug/kg with detection limits of 5 ug/kg.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

- *No hits were detected above the assigned detection limits.
- *Met 14 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *All RPD's, initial and continuing calibrations were within acceptable QC Limits.
- *Initial and continuing calibrations had % Differences that were outside QC Ranges but within area QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Metals

Lead-SW7421=

- *Hit was detected at 4.3 mg/kg with the detection limit of 0.4 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Chromium-SW7191=

- *Hit was detected at 11 mg/kg with the detection limit of 1 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Cadmium-SW6010=

- *No hit was detected above the assigned detection limit of 0.5 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Nickel-SW6010=

- *Hit was detected at 15 mg/kg with the detection limit of 2 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Mercury-SW7471=

- *No hit was detected above the assigned detection limit of 0.1 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

SOIL

025-012BH 19.5'-20'

Lab ID# H9-9505673-03

Date Sampled: 05/17/95

Date Received: 05/18/95

Volatiles

SW846-8240 =

- *No hits were detected above the assigned detection limits.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

- *No hits were detected above the assigned detection limits.
- *Met 14 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *All RPD's, initial and continuing calibrations were within acceptable QC Limits.
- *Initial and continuing calibrations had % Differences that were outside QC Ranges but within area QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Metals

Lead-SW7421=

- *Hit was detected at 5.3 mg/kg with the detection limit of 0.4 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Chromium-SW7191=

- *Hit was detected at 13 mg/kg with the detection limit of 2 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Cadmium-SW6010=

- *No hit was detected above the assigned detection limit of 0.5 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Nickel-SW6010=

- *Hit was detected at 9 mg/kg with the detection limit of 2 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Mercury-SW7471=

- *No hit was detected above the assigned detection limit of 0.1 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE:

SOIL

025-013BH 11.5'-12'

Lab ID# H9-9505673-04

Date Sampled:

05/17/95

Date Received: 05/18/95

Volatiles

SW846-8240 =

- *No hits were detected above the assigned detection limits.
- *All met 14 day holding time.
- *COC information verified.
- *All initial and continuing calibrations were within acceptable QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Semivolatiles

SW846-8270 =

- *No hits were detected above the assigned detection limits.
- *Met 14 day extraction holding time and 40 day extract holding time.
- *COC information verified.
- *All RPD's, initial and continuing calibrations were within acceptable QC Limits.
- *Initial and continuing calibrations had % Differences that were outside QC Ranges but within area QC Limits.
- *All surrogate recoveries were within acceptable QC limits.
- *Blanks were clean of any contamination.

Metals

Lead-SW7421=

- *Hit was detected at 3.2 mg/kg with the detection limit of 0.4 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Chromium-SW7191=

- *Hit was detected at 6 mg/kg with the detection limit of 1 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Cadmium-SW6010=

- *No hit was detected above the assigned detection limit of 0.5 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Nickel-SW6010=

- *Hit was detected at 16 mg/kg with the detection limit of 2 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

Mercury-SW7471=

- *No hit was detected above the assigned detection limit of 0.1 mg/kg.
- *Met 6 month holding times.
- *COC information verified.

*Need Metals Raw data for all analytes run.